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THE TARIFF DEBATE OF 1909 AND THE
NEW TARIFF ACT

SUMMARY

The "true principle," of equalizing cost of production, virtually new in 1908, 2. — Its fallaciousness, 2. — High wages and cost of production, 4. — Significance of the "true principle" as a concession to the demand for revision, 5. — Character of the debate of 1909, 7. — Crass protectionism, 9. — The Bill before the Ways and Means Committee, 11. — German comments pigeonholed, 13. — Action of the House, 15. — Situation in the Senate; log-rolling brings advances in duty, 16. — Conference Committee settles details, 18. — Duty on hides abolished, 19. — Duties on lumber and iron reduced, 21. — Iron and steel duties lowered, 24. — Shoes and leather, 25. — Advances on cotton goods, hosiery, silks, 27. — Economic characteristics of these industries, 31. — Insignificant changes on wool and woollens, 31, and on sugar, 33. — Sugar from the Philippines free, 34. — Advances on petty items, "jokers," 35. — Maximum and minimum provisions, 36. — Conclusion 38.

The tariff act of 1909 comes after an unusually long interval. Its predecessor, the act of 1897, remained in force for twelve years, and thus proved the longest-lived of all our tariff measures; its nearest rival having been the act of 1846, which lasted eleven years. The new tariff comes, as usual in recent times, immediately after a presidential campaign, and in pursuance

of promises made in the campaign. The Republican party in its platform of 1908 promised to revise the tariff; and its candidate, soon to become President Taft, pledged his efforts to secure such revision, — "revision" being understood by him and by the public generally to mean primarily reduction of duties. In what manner has the revision proceeded, and to what degree has reduction been brought about?

The Republican platform contained a new version of the principle on which protection was to proceed: paraded, to be sure, as the "true" or "long-established" Republican doctrine, but nevertheless, in its precision of statement, substantially new. The doctrine was laid down as follows:

"In all protective legislation the true principle of protection is best maintained by the imposition of such duties as will equal the difference between the cost of production at home and abroad, together with a reasonable profit to American industries." This notion, very little heard of before, played a surprisingly large part in the discussions of 1908-09, and was hailed in many quarters as the definitive solution of the tariff question.¹ It has an engaging appearance of moderation; yet it leads consistently to the most extreme results. It seems to say, — no favors, no undue protection, nothing but equalization of conditions. Yet little acumen is needed to see that, carried out logically, it means simple prohibition and complete stoppage of foreign trade.

Anything in the world can be made within a country if the producer is assured of "cost of production together with reasonable profits." In a familiar pas-

¹ The Republican platform of 1904 had a similar phrase: "the measure of protection should always at least equal the difference in cost of production at home and abroad." This seems to be the first platform statement of the "true principle"; but very little attention was given it in 1904.

sage of the *Wealth of Nations*, Adam Smith remarked that "by means of glasses, hotbeds, and hot walls, very good grapes can be raised in Scotland, and very good wine can be made of them at about thirty times the expence for which at least equally good can be brought from foreign countries."¹ In the same vein, it may be said that very good pineapples can be grown in Maine, if only a duty be imposed sufficient to equalize cost of production between the growers in Maine and those in more favored climes. Tea, coffee, raw silk and hemp, — any quantity of things that are now imported, can be produced in the United States, provided only that a duty high enough be imposed. No doubt it will be said that these things are not "fitted" for our natural conditions, and that duties should not be "unreasonably" high. But, as Adam Smith remarked further: "If there would be a manifest absurdity in turning toward any employment thirty times more of the capital and industry of the country than would be necessary to purchase from foreign countries an equal quantity of the commodities wanted, there must be an absurdity, though not altogether so glaring, yet exactly of the same kind, in turning toward any such employment a sixtieth, or even a three-hundredth part more of either." The difference is simply one of degree. Sometimes a moderate duty may be called for in order to "equalize cost of production," sometimes a very high duty. Consistently and thoroly applied, the "true principle" means that duties shall be high enough to cause anything and everything to be made within the country, and international trade to cease.²

¹ *Wealth of Nations*, Book IV, ch. II; vol. I, p. 423, Cannan edition.

² It is not often that unflinching application of "the true principle" is advocated, but the following extract from the Congressional Record (May 17, 1909, p. 2182) indicates that the foremost protectionist leader is willing to go all lengths.

MR. ALDRICH. Assuming that the price fixed by the reports is the correct one, if it costs 10 cents to produce a razor in Germany and 20 cents in the United States, it will

On the other hand, the "true principle," consistently analyzed, means that the more disadvantageous it is for a country to carry on an industry, the more desperate should be the effort to cause the industry to be established. Of course the term "cost of production" is used, in these discussions, in the sense of the money advances that must be made by the employing capitalists. The more labor must be employed at current wages to get to market a given article, the larger these money advances become. In other words, they are large because (for whatever reason) much labor is required per unit of produce; that is, because the efficiency of labor is low. One of the most familiar facts of industry, tho one most commonly forgotten in the protective controversy, is that high money wages do *not* necessarily mean high prices of the things produced. When labor is effective, high wages and low prices go together. Obviously the community is prosperous precisely in proportion as this combination exists, — high wages and low prices. But where labor is ineffective, there, if money wages be high, high prices will ensue. The more of high priced labor must be employed in order to produce a given article, the higher will be its "cost of production," and the higher must be the duties in order to "equalize cost of production at home and abroad."

All the current notions on this topic among the staunch protectionists rest on the belief that high

require 100 per cent duty to equalize the conditions in the two countries. . . . And so far as I am concerned, I shall have no hesitancy in voting for a duty which will equalize the conditions.

Mr. BAILEY. The Senator from Rhode Island would vote unhesitatingly for a duty of 300 per cent.

Mr. ALDRICH. If it was necessary —

Mr. BAILEY. If he thought it was necessary.

Mr. ALDRICH. Certainly. If it was necessary to equalize the conditions, and to give the American producer a fair chance for competition, other things being equal, of course, I would vote for 300 per cent as cheerfully as I would for 50.

wages (high money wages, that is, — few go beyond this phase of the problem) cannot be maintained in our American community unless there be protection against the commodities made by cheaper labor abroad. And this belief rests on the notion that high wages necessarily mean high prices.¹ The truth is that a high general level of real wages is the outcome of high general efficiency of labor. Given such efficiency, it would continue, tariff or no tariff. But this seems to the protectionists an incredible proposition. The verdict of the economists, tho practically unanimous against their belief, has no visible effect in overthrowing it. That high wages are due to the tariff, and cannot be kept high without high duties, has been dinned in the ears of the public so persistently that it has become for the average man an article of faith. To connect high wages with the effectiveness and productiveness of labor; to consider whether it is worth while to direct labor into industries where it is not effective; to reflect what it really means to "equalize" a high domestic cost of production with a lower foreign cost; in fact, to reason carefully and consistently on the tariff question, — all this, unfortunately, is almost unknown. The average employer and the average laborer alike accept the familiar catchwords and fallacies: let us stimulate employment, make demand for labor, create the home market, equalize cost of production, preserve American industries and the American standard of living.

None the less, this "true principle" is significant of some concession to those who believe that production has been carried too far. There has been an un-

¹ On the general subject of the connection between money wages, prices, and international trade, I have stated my conclusions in a paper on "Wages and Prices in Relation to International Trade," *Quarterly Journal of Economics*, August, 1906 (vol. xx, p. 497).

easy feeling that duties have been *more* than sufficient to "equalize," and that they bring *more* than "a reasonable profit" to American producers. As every one conversant with our tariff system knows, they have often been excessive in this sense. They have been higher than was necessary to enable the domestic producers to hold their own. A vast number of the duties are simply prohibitory. Many are innocuous as well as prohibitory, — mere nominal imposts, on articles produced as cheaply within the country as without, and not importable under any conditions. Such are the duties on wheat, corn, cattle and meat, and other agricultural products, — dust in the farmer's eyes. Such too are the duties on cheaper cotton goods, on boots and shoes, and many other manufactured articles. On still others the rates, while so high as to prohibit importation, are not nominal: cost of production may be higher in the United States than abroad, yet only a little higher, so that the duties go beyond the point of mere "equalizing." Such seems to be the case with certain grades of woollens and silks. In the absence of any importation of competing goods (the woollens and silks that continue to be imported are mainly special articles, different from the domestic textiles) it is difficult to calculate just how far an equalizing duty at all may be needed, on the basis of "the true principle." But it is certain that existing rates are much more than equalizing.

Where competition is effective among domestic producers, the rates which are in this sense excessive do no special harm. Where, however, competition is not effective and the domestic producers have a monopoly or quasi-monopoly, the duties obviously are not only excessive from the standpoint of "the true principle," but do substantial harm in aiding the

avored producers to get abnormal profits. The general uprising against combinations and trusts has contributed to a more critical scanning of the tariff schedules, and also to a belief that any duty which is "unreasonably" high yields the domestic producer unreasonable profits. To feelings of this sort there is a concession in the "true principle": let your duties be high enough to equalize cost of production, but not more than high enough.

So far as questions of principle are concerned, the Congressional debates of 1909, like those of other years of tariff legislation, are depressing for the economist. There is hardly a gleam of general reasoning of the sort which is applied in our books to questions of international trade. This is not due to any lack of diligence on the part of the legislators. Often there is great knowledge of detail, indicating laborious study. Both Messrs. Payne and Aldrich, the leaders of the majority in the House and Senate, were remarkably well informed, not only as to the rates of duty, but as to industrial conditions in the industries affected. Other senators and representatives were hardly less conversant with the facts, especially so (as might be expected) in regard to duties and industries that affected their constituents. Not infrequently, to be sure, their utterances bore the clear marks of cramming at short notice. None the less, while there was the usual amount of general speechifying and of orations published — under "leave to print" — without having been delivered, there was some real and effective debate on details, especially in the Senate. But all those details were treated from the "practical" point of view: whether proposed duties were "unreasonably" high, whether imports were in fact increasing, whether

the domestic producers at the moment were in difficulties or were making money.¹

That there should be general acceptance of the protectionist principle, and that the only question in debate should be whether duties were "unreasonably" high, was natural enough. Most people get used to existing conditions, and cannot easily conceive of anything different. Thus the national bank system was long regarded in this country as the inevitable and necessary system, and in the main is still so regarded. Our traditional method of levying taxes on property is similarly rooted in the ordinary thinking of Americans. For a long period, until the "tariff reform" agitation began in Great Britain, the only thing which an Englishman regarded as in the nature of things possible, was a policy of free trade. Protection is in the same way a matter of course with most people in the United States, and will be so until some turn in the political wheel brings up "tariff reform" (in the other sense) and jostles men's thoughts out of their accustomed channels. And it is not only natural, it is sensible, that the immediate question should be simply as to the degree of protection. An abrupt change of policy is as inexpedient as it is politically impossible. Where the industries of a country have adapted themselves through a long period to a given policy, that policy cannot be wisely changed except by gradual steps.

¹ Thus a California senator, arguing in favor of an increased duty on lemons, gave elaborate figures as to imports, domestic supplies, division of the market; and said — (Congressional Record, p. 2823) "there are now about 2,000 carloads of lemons in storage in Southern California for which no markets at living prices have been found, and the growers are again in considerable numbers rebudding their lemon trees with oranges. The industry is at a standstill, and unless relief is obtained in this bill it will be only a few years until this country will be dependent upon foreign producers for practically its entire supply of lemons," — horrible thought! The Californians finally secured not only their higher duty on lemons, but some other advances also. The rate on lemons went up from 1 to 1½ cents a pound, on figs from 2 to 2½ cents a pound, on grapes from 20 to 25 cents per cubic foot of package. An advance was also made on pineapples. There seems to me no rational ground for any of these changes.

None the less, it is disheartening to see how crass is the protectionism of most leaders in the dominant party. The point of view is that of the most ordinary mercantilism: as if imports were necessarily a cause of loss and an increase of imports always ominous; as if domestic production were necessarily good and its increase always a matter for rejoicing. Foreign producers are spoken of as a predatory band, united in a compact monopolistic body, ready to pounce on "our great American market."¹ That there is such a thing as a geographical division of labor between countries as well as within a country, and that a country may gain by importing things for which its industrial conditions are not favorable, — this simple point of view never once (so far as I have observed) was presented in the debates. The universal notion was that of equalizing the competition, and making sure that the domestic producer was given command of the field, according to the "true principle." Even when the most obvious natural factors explained the continuance of importations, the suggestion seems never to have been made that supply from across the border might possibly be the best arrangement after all.

No better illustration of this state of mind can be found than in a speech made by Senator Elkins, who argued that the duty on coal should be retained for the protection of the mining industry of Washington and adjacent states, — because their mines were ill situated and produced inferior coal! The coal mines of British Columbia were declared to be evil competi-

¹ "Senator HALE: What to me in this discussion [of a proposed increase in the duty on razors] is brought out more clearly than anything else, and which is extremely depressing, is the raid that has been made in the last few years by foreign producers, particularly those of Germany, to get possession of our markets for this product. . . . the determined invasion into the American market of foreigners, and especially the Germans." Congr. Record, p. 2180. Cf. what is said below of the higher duty on razors which finally was imposed; pp. 27, 28.

tors, not only on the stock ground that they had lower wages and longer hours, but because they had natural advantages. They are near tide-water, whereas the American mines have to ship by rail; their coal is more easily and cheaply mined, and is of a higher grade. "The coals of British Columbia are inexhaustible and better than the coals of Washington and other western states." It never seems to have occurred to this speaker, or to any critic, that such bounty of nature could be a cause not of disadvantage, but of advantage to the adjacent American region. Had the Oregon dispute of 1844-46 turned out as the American hot-heads then wished; had we stuck to the policy of "54°—40' or fight," and had the region which is now British Columbia become a part of the United States, — how we should have rejoiced in its inexhaustible supplies of good coal! But as soon as this coal proves to be on the other side of a political line it is no longer a boon, it becomes a peril. No: "the principle of protection is to build up our home industries by manufacturing our own products, — this gives our people employment, keeps the money in the country, and makes this country an independent and self-reliant nation."¹

With protection of the indiscriminate sort urged in this way, it is not to be expected that the more intricate questions should be probed. In the legislation of 1909, as in that of earlier years, marked advances in the rates were proposed on certain articles, usually articles already subject to high duty. Such for ex-

¹ See Congressional Record, pp. 2934, 2935. In much the same vein, a representative from Wisconsin argued in favor of retaining the duty on barley because "Canadian barley can be supplied to the malt houses of Buffalo, Oswego, and other eastern cities at a much less cost of transportation than from the farms of Wisconsin, Minnesota, and the Dakotas. The present rate of duty offsets the advantage of the Canadian farmer on the shorter haul, and thus preserves the eastern market for the American farmer." *Ibid.* p. 4558.

ample were some sorts of cotton hosiery, finer cotton piece goods, women's gloves, some grades of plate glass, and the like. *Prima facie*, the fact that duties already high had not sufficed to bring about the domestic production of these things would seem to be a reason for allowing them to be obtained by importation. At all events the question arises, why do imports continue in face of high duties, and why are still higher duties demanded? Are there any conditions in the methods of production which explain the high cost of the domestic articles, the continued imports, and the "need" of higher protection? And is there any ground for expecting that conditions will change, and that the need for protection will not continue indefinitely? These are the questions of real difficulty; but they receive practically no consideration at all.¹ Sometimes there is an intimation that tho prices will be raised at first, eventually they will become lower for American consumers. In other words, there is an endeavor to apply the "young industries" argument. But even this is rare. Usually it is assumed as a matter of course that the continuance of the imports is an evil and that the acquisition of a "new industry" is necessarily an advantage to the country. The more difficult it is to bring about its establishment, and the higher the "labor cost," then the more is there supposed to be ground for raising the duties, so as to give additional employment to American labor and apply the "true principle" in still another direction.

A disposition to scan duties critically according to their conformity to the "true principle" was shown by the Ways and Means Committee of the House, in which the consideration of the tariff measure began.

¹ Something more is said on this topic below, on p. 29.

The chairman of that committee, Mr. Payne, tho a staunch protectionist, was not a fanatical one. On sundry schedules the inquiries of the Committee, under his leadership, were directed toward a comparison of domestic and foreign cost, and a comparison again of the difference in cost with the rates of duty.¹ It is true that inquiries of this sort, conducted in hearings before Congressional Committees, can lead to no accurate results. The persons who appear as witnesses are almost invariably interested producers, and the figures and statistics presented by them are of very doubtful value. Any one who looks over the reports of these hearings must observe how vague and obviously exaggerated are the recurring statements about wages and cost of production. If accurate information on these matters were desired, the effective method would be to engage agents or "experts," say from the Bureau of the Census or the Bureau of Corporations, and give them a year or two in which to make careful investigation. Even so, in view of the variations of cost of production in different establishments, and the difficulty of selecting the representative firms, it may be questioned how far usable results could be got. At all events, no such systematic procedure was thought of. The usual array of indiscriminate figures was

¹ Mr. Payne's attitude is indicated in the following passage from his speech introducing the bill:—

"Some gentlemen think in order to be protectionists that after they have found out the difference between the cost of production here and the cost abroad they ought to put on double that difference by way of a tariff rate, and they are willing to vote for such a provision in the bill, and if crowded they will go to three times that amount. I do not believe that such a man is a good friend of protection. I believe we should fix these duties as nearly as we can at the difference between the cost here and the cost abroad, and not after we have decided what that difference is, double it, add 100 per cent to it. . . . He is the better friend to protection who tries to keep the rates reasonably protective to the people engaged in the industry." *Congr. Record*, p. 7.

It should be noted, to Mr. Payne's credit, that his speech introducing the tariff bill was a very careful one, explaining with much detail the changes proposed. In its fullness of detail it was in marked contrast with the flamboyant and empty speeches with which Messrs. McKinley and Dingley introduced in the House the tariff bills of 1890 and 1897.

presented and printed, with a natural tendency on the part of the protectionists to accept without question statements indicating that their true principle could be maintained only by keeping duties very high.¹

The hearings before the House Committee led to a curious and instructive episode. It is significant of the trend of international competition that the rivals most frequently held up as menacing by the petitioners for higher duties were the Germans, not, as in the hearings of earlier periods, the English. The statements in regard to wages in Germany were so loose and exaggerated that the Germans were led, both by pride and by a hope of affecting the course of legislation here, to take notice of them. Their government referred the printed hearings to various firms in Germany. A whole sheaf of comments was transmitted by the German foreign office to our Department of State, and by this to the Senate. They reached the Senate Committee on Finance early in April, and slumbered there for a month. In May some of the so-called "insurgent" Senators asked for them, and they were ordered to be printed. But they were not printed until August, after the adjournment of Congress. It was said, in explanation of the delay, that the government printing-office was so busy as to be unable to bring them out earlier. But this was obviously a pretext. Anything that Congress really wanted was supplied

¹ The Hearings of 1908-09 before the Ways and Means Committee were prolonged, and contain, in addition to the usual mass of irrelevant and useless matter, much material valuable for the student of economics. They have been printed, too, with more care than has been shown on previous occasions, in eight volumes, arranged by topics, and well indexed.

There were no hearings before the Senate, though there were unreported "conferences" between the members of the Senate Finance Committee and persons interested in the duties. Senator Aldrich, in discussing various details, referred to figures as to cost of production presented to his Committee by domestic producers; but such figures, not subject even to the test of publicity, have still less weight than those presented to the House Committee.

Cf. what is said below as to the Tariff Commission, p. 36, note 2.

with exemplary promptness. The truth clearly is that the ruling spirits in the Senate did not wish the information to be put at the disposal of opponents. Any one who looks through the document will see that for this they had good ground. The figures given by American producers as to wages in Germany, and other figures supposed to show differences in cost of production, are shown to be virtually worthless, and not a little instructive information is given on the general aspects of tariff rivalry. But probed and sifted information was not desired by the Republican leaders, or at least by those who guided the course of action in the Senate. Any sort of vague and exaggerated statement as to wages and cost was readily accepted, and made the occasion for a drastic application of the sanctified "true principle."¹

Two sets of reductions in duties engaged the special attention of the House Committee: as to iron and steel, and as to certain raw materials. The conspicuous position of the Steel Corporation compelled attention to the former. To the point of removal of the iron and steel duties the Committee would not go; but some reductions were proposed. The raw materials most discussed were coal, lumber, iron ore, hides. These the Committee proposed to admit free of duty. As to the fate of the proposals more will be said presently.

On the other hand, some advances in duty were frankly proposed, usually on the ground that the "true principle" called for them. The duties on mercerized cottons—fabrics treated by a process which gives them a silk-like sheen—were advanced, because of the "additional labor and the difference in the cost of labor." The duties on women's gloves and on cer-

¹ The German reports were finally printed as Senate Document No 68, Part 2, 61st Congress, 1st session.

tain sorts of hosiery were similarly increased. Other advances could be less easily defended on grounds of this sort, and were the obvious result of pressure from some geographical district, or from some legislator who had to be placated. Zinc ore, previously free, was subjected to duty because the people of the Missouri zinc mining district insisted on their share in the benefits of protection. The duty on split peas was increased, — a petty matter, worth noting only because of the explanation of the change, — on "the personal knowledge and evidence of a member of the House who knows all about the business."¹ The duties on some fruits — figs, prunes, lemons — were raised as a sop to the California members. There were other instances of this sort, — advances of rates proposed because some member of the Committee had a constituent who was interested in a particular article, or because the Committee felt it necessary to make sure of the vote of a given region. None the less, the House bill made significant reductions: none of revolutionary character, or likely to have serious economic effects, yet indicative of a disposition to bring about some "real" revision.

No great changes from the Committee's rates were made in the House itself. Notwithstanding active debate, and a vigorous attempt by interested representatives to retain duties as against the proposed extension of the free list, the bill as passed by the House was substantially that prepared by the Committee. On the hotly debated items of coal, hides, iron ore the Committee was sustained: they were left on the free list. On lumber, the leaders could not hold the House; a duty was retained, but at half the existing rate.

¹ I quote from Mr. Payne's speech introducing the bill; Congr. Record, p. 9.

In the Senate the course of events was different. In most of the tariff acts of the last generation, the influence of the Senate on legislation has been greater than that of the House, and has been exercised in favor of higher duties. The greater influence of the Senate is the natural result of its smaller size, its compactness, and the longer term of its members. That this greater influence should have been exercised in the direction of higher duties, has been often ascribed to the greater subservience of senators to large monied interests. There is truth in this. In legislation on other subjects also, especially in the long contest over railway legislation, it has appeared that the Senate is, if not the stronghold, at least the stronger hold of those corporations and industries whose money-making may be affected by legislation. But so far as the tariff is concerned, another circumstance is at least equally important in explaining the ultra-protectionism of the Senate. Each State is equally represented. Montana and West Virginia have as many votes as New York and Iowa. The senators from a thinly populated state have disproportionate power in fighting for duties that are, or are supposed to be, for the interest of their constituents. Geographical representation in the Senate, as well as the relation between the individual members resulting from senatorial courtesy in confirming appointments,¹ is thus peculiarly favorable to log-rolling. The votes of small dissatisfied states cannot be ignored, as they can in the House. Washington, Idaho, Montana, Wyoming, West Virginia will easily combine in favor of duties on coal and on hides, and together constitute a formidable phalanx. The strictly manufacturing states, such as Massa-

¹ Cf. the extract given below, (p. 20), from Mr. Payne's remarks as to the duty on hides in 1897.

chusetts and Pennsylvania, feel it necessary to conciliate such a group, and to let them have duties on their local products, in order to secure their adhesion to the general protectionist scheme. The log-rolling process, as has been said by President Lowell, is the great evil of democratic government; and that evil nowhere appears more conspicuously than in the dealings of a body like the American Senate with tariff legislation.

Nevertheless, there was a vigorous protest from within the ranks of the Republican party. The senators from some of the great agricultural states of the Middle West — Wisconsin, Iowa, Nebraska, Minnesota, stood staunchly for reductions in duties. Their constituencies, more strongly than any other part of the country, felt hostility to real and supposed monopolies. They represented the healthy uprising against monied domination, the resolution to grapple with the great social and industrial problems of the twentieth century. No doubt the tariff was less closely connected with those problems than they and their representatives supposed. A combination and monopoly was smelled behind every high duty, even tho (as in the case of the cotton manufacture) the conditions clearly were not those of monopoly. No doubt, too, there was the usual half-heartedness and inconsistency in their attitude on the general question. They were taunted with being unfaithful to their party and even (after the common question-begging way of the fanatical protectionists) with being allies of designing foreigners and enemies to their country. To this they replied that they were the true and faithful and reasonable protectionists. Even these determined critics never planted themselves on any ground of clear-cut principle. They simply represented a strong feeling

of unrest and discontent, which the leaders in the Senate disregarded on the tariff as on other questions.

The combination of local interests in the Senate was made the more effective by the leadership of Senator Aldrich. Senator Aldrich, unlike the House leader, was a protectionist of the most unflinching type. At the same time he had had long experience and was exceptionally well informed on tariff details. His influence goes far to account for the amendments made in the Senate. These were no less than 847 in number; many of them, to be sure, merely on matters of form and phraseology, but over half of substantial importance. Their drift was upwards. The much debated raw materials, iron ore, hides, coal, were again made subject to duties; the duty on lumber was raised above the rate fixed in the House. The duties on cotton goods, hosiery, and other manufactures were advanced. Many of the changes substituted specific for ad valorem duties, or shifted the dividing line in the progression of specific duties. Just what such changes mean is often difficult for even the most expert to ascertain.¹ It is tolerably certain that, made under such auspices, they would tend in general to tighten the extreme protective system, and were likely to embody "jokers," — new rates of real importance, advantageous to particular producers, and concealed in the endless details.

So the bill went to a Conference Committee, and there, as usual, its details were finally settled. The Conference Committee consisted of eight members from each house, five Republicans and three Democrats. The Democrats were put on the Committee

¹ "Some of these amendments I have studied diligently, and I am not able to say to-day whether they raise or lower the rates, and have not been able to determine yet with the aid of gentlemen who are experts on this subject." Mr. Payne, in the brief House debate on the Senate amendments: *Congr. Record*, p. 4468.

only *pro forma*. The ten Republicans from the two houses got together by themselves, and came to an agreement, against which the six Democrats simply registered the stock partisan protest. Such has been the procedure with all the tariff legislation of the last generation. What passed in the Conference Committee can only be guessed, but guessed with some certainty: weary sessions, hurried procedure, give and take, insistence by this or that member among the ten on some duty in which he is particularly interested. Irresponsibility in legislation reaches its acme.

In one respect a new influence was brought to bear on the Conference Committee, and a new responsibility was assumed. The administration suddenly brought pressure to bear in favor of the House rates, or rather in favor of lower rates all around. President Taft had pledged his party, during the campaign, to undertake a revision of the tariff downward; and it had been given out, apparently on good authority, that he would veto a bill that failed to carry out the pledge. During the long debates in both houses, he had abstained from any serious effort to influence the course of legislation. But at the very last stage — it is not certain whether from a sudden change of tactics, or in pursuance of a policy kept till then deliberately in the background — he took the position of titular head of the party, and urged reductions in duties. His outspoken attitude strengthened the moderate element, and finally brought about a measure less stultifying in view of his own pledges than had seemed possible when the bill first went to the Conference Committee.

The most hotly disputed single item was the duty on hides. These had been free of duty from 1872 to

1897. In 1897 they had been subjected to a duty of fifteen per cent. on the insistent demand of the representatives of the grazing states, especially Montana.¹ The House passed the bill of 1909 with hides free; the Senate, again at the insistence of the grazing states, proposed to restore the duty of fifteen per cent. Instead of a compromise, in the shape of a reduced rate, such as might be expected to result from this disagreement, complete abolition of the duty was finally secured. This victory of good sense was clearly due to President Taft, and constituted the one conspicuous fulfilment of his pledge to bring about really lowered duties.

On any but the most extreme protectionist principles, there is no excuse for a duty on hides. There can be nothing in the nature of protection to young industries, — no prospect of ultimate cheapening through a stimulus to improved domestic production. Even the "true" principle of equalized cost of production could not be applied to a by-product of a flourishing export industry. Nor were any arguments of this sort presented in favor of the duty. The case was put frankly on the ground of give and take; if everything is to be protected, why not hides?² And on this ground, the ranching representatives had a

¹ The duty of 1897 applied only to cattle hides. Calf-skins, goat-skins, sheep-skins, horse-hides, and the like, have continued throughout to be free of duty.

² Mr. Payne gave the following account of the way in which the duty on hides came to be imposed in 1897: —

"When the Dingley bill came before the House, reported by the Committee, it was reported with free hides, and I saw a number of gentlemen on this [the Republican] side of the House, and a number of gentlemen on the other side of the House, led by Jerry Simpson of Kansas, voting for a duty on hides. He was a little more frank than some of these modern-day tariff-for-revenue people. He said he wanted to get his share. He did not believe in a duty on hides, but he wanted to get his share. . . . It went over into the Senate. We did not have a Republican majority in the Senate in those days, but we did have a majority of those who claimed to be protectionists, and one of these protectionists of populist tendencies would not vote for the bill unless it carried a duty on hides, and the Senate accommodated him. *That is one of the courtesies of the Senate when any member wants something done.*" Congr. Record, p. 21.

case. If imports are bad *per se*, and domestic supply is good *per se*, why should the imports of hides be free when wool, hemp, flax, lumber, ore, remain dutiable?

It happened, too, that the duty on hides had not been, like so many on crude products, of limited effect. The imports were a considerable portion of the total supply, and the imported and domestic hides came in competition in the same market.¹ The case was one where the protective duty had its full effect: the price of the whole domestic supply, as well as of that imported, was raised by the amount of the duty. It is striking that a country in which cattle raising is so largely carried on, and from which meat-products are so largely exported, should yet import great quantities of hides. The demand for this joint product, or "by-product," is relatively great in the United States. No satisfactory substitute has been found for leather, whether for footwear, harness, belting, or the other manifold uses; and our prosperous and well-equipped population calls for great quantities of it.

Other raw materials were treated in more gingerly fashion, and the original proposal for admitting them free was not carried out. Coal, which the House had proposed to admit free, was finally subjected in the act to a duty of 45 cents a ton, in place of the 1897 rate of 67 cents. Iron ore, which also the House had proposed to make free, was made dutiable at 15 cents, in place of 40 cents. It has already been noted that the proposal for free admission of lumber made by the Ways and Means Committee, could not be carried even through the House. The duty there was set,

¹ In an elaborate statement compiled by the Census Bureau, on "Imports, Exports, and Domestic Manufactures," the following figures are given as to cattle hides:

	Pounds	Values
Imports (1904-5)	111 mill.	14.5 mill. dollars
Domestic Product (1904)	456 mill.	44.2 mill. dollars

on the lowest grade, at \$1.00 (per thousand feet); the Senate proposed \$1.50; the act finally made the rate \$1.25, in place of the 1897 rate of \$2.00. On the other hand, free admission was finally secured for wood pulp. A special committee had made an investigation on pulp and paper, and had reported in favor of the free admission of pulp from countries not imposing export duties on pulp and pulp wood, — this referring, of course, to Canada. With this change went a reduction in the duty on printing-paper, from \$6.00 to \$3.75 a ton.¹

As to all such changes on materials, there is a question how far reductions or remissions will redound merely to the advantage of the manufacturer or middleman, how far to that of the "ultimate consumer." Free hides, it was said, would benefit only the tanners or the shoe-makers, but the price of shoes would not be affected. The answer obviously is that the case is the same with every cause lessening the price of materials,—improved processes, better transportation, and what not. The final result in cheapening consumers' goods may come slowly and haltingly; but so long as there is effective competition among the several series of producers and middlemen, and so long as there is a cheapening of the materials for all those engaged in supplying a given market, the legislator may feel safe in providing for free materials.

¹ The Committee on Pulp and Paper, of which Mr. Mann of Illinois was chairman, made an elaborate investigation, and presented a compact and able report in favor of free pulp and pulp wood (conditional on there being no export tax in Canada) and of a reduction of the duty on printing paper to \$2.00 a ton. The Senate proposed a duty of \$4.00 on paper, with a threat of an additional \$4.00 in case of export tax. The final compromise brought a duty of \$3.75, with a similar threat of additions. In Canada, the Province of Quebec gives a partial rebate of the ordinary royalty for lumber cut on public lands, if manufactured into pulp wood within Canada. This has been held equivalent to an export duty on pulp wood going out of Canada. It applies only to wood from public lands, not to that cut on private lands. What action will now be taken in Canada (i.e. by the Province of Quebec) remains to be seen.

No doubt the cheapening of materials sometimes affects only a part of the market. Lower duties on coal and lumber, or their free admission, have but a limited range of influence. Free coal would be to some advantage for coal-users in New England and the extreme Northwest; though in both districts the possible consequences are much exaggerated both by advocates and opponents. Free lumber would lead to slightly larger importation from Canada along the eastern frontier, but probably to none of any moment in the Northwest. It would check a bit, even if only a bit, the wastage of our own forests, and in so far is clearly sound policy. Not a few Southern representatives voted for the retention of the duty on lumber, and their votes turned the scale in its favor. Yet, both because of geographical limitation of competition and because of the different quality of Southern lumber, the duty is of no real consequence for their constituents. The attitude both of constituents and representatives illustrates the state of veritable funk concerning lower duties (not to mention free trade) which has been induced by the constant shouting about safeguarding American industries against pauper labor.

Iron ore (on which the duty was reduced from 40 to 15 cents a ton) presents a case where the effect of lowered duties is even more limited. The only ores likely to be imported are those from Cuba, where some great deposits have long been known, and others even greater have recently been found. The iron and steel makers of the Eastern seaboard would be the first beneficiaries from having the ore free, being indeed already the owners of the ore lands.¹ How far the price of iron and steel would be affected, must be

¹ The chief enterprises directly interested are the Pennsylvania Steel Company and the Bethlehem Steel Company, both of them rivals (more or less friendly) of the Steel Corporation.

problematical; still more, how appreciable would be the final effect on the prices of the things made with the iron and steel. All that can be said is that in some degree competition with the great Steel Trust would be promoted, and some better opportunity given for the development of the rival iron-making industry of the eastern region.

On iron and steel the process begun in 1890, of reducing duties no longer of any effect, was carried a step further. The rates were lowered along the whole range, as will be seen from the following typical figures:—

	Duty of 1897	Duty of 1909
Pig iron	\$4.00 ton	\$2.50 ton
Scrap iron and steel	4.00 "	1.00 "
Steel Ingots (lowest class)	6.72 "	3.92 "
Steel Rails	7.84 "	3.92 "
Tin Plate	1½ c. a pound	1⅓ c. a pound

Nobody supposed that these changes were of consequence. Possibly the low rate on scrap iron and steel may cause a slight increase in importation for the use of foundries near the seaboard; and there may be sporadic importations of other sorts of iron, on occasions of unusually active demand, or at points (in New England or on the Pacific coast) far from the centers of domestic production. But the time has gone by when the duties on crude iron and steel have any considerable effect. The "true principle," if rigorously applied to the vast integrated enterprises which now constitute the representative firm in iron-making, would lead to the complete repeal of all these duties.

One point in the discussion of the iron and steel duties deserves a word of comment. It was main-

tained that the "true principle" called for a retention of duties because cost of production had risen in the United States in recent years;¹ and one of the most important items of increased cost was alleged to be in the higher prices of ore and coke. To the "unpractical" economist it seems obvious that these higher prices of materials are (in the main) the *result* of higher prices of iron and steel, not the cause of higher cost in producing the iron and steel. As to those enterprises that possess their own mines of ore and coal (and most of them do, conspicuously the Steel Corporation), the higher price of the materials is simply a book-keeping item, a cross-account between integrated corporations. To say that, under these conditions, higher prices for ore and coal mean higher cost of production is very like saying that a higher rate of dividend on a railway means higher expense of conducting the traffic.

With free hides came reductions in duties on corresponding manufactures, — on leather from 20 per cent to 5 per cent, on shoes from 25 per cent to 10, on harness and saddlery from 35 per cent to 20. These reductions were insisted on, with a touch of vindictiveness, by the ranching representatives as the counterpart of free hides, and were somewhat grudgingly accepted by the representatives of the leather and shoe districts. Here again no one supposed that any real changes would ensue from the lowered duties. Tanning and shoe-making are among the industries in which American labor is applied with resource and advantage, in which high wages and low prices are made possible by efficiency and ingenuity, and in which there are exports, not imports. The hesitation in

¹ See for example Mr. Schwab's testimony before the Ways and Means Committee. Hearings, pp. 1632, 1633.

acceding to the reduced duties arose chiefly from that pusillanimity about foreign competition which pervades almost the whole manufacturing community.

In the case of shoes, of which the exports are considerable, it was said that not only American shoes were being exported, but American shoe-machinery also, and that after a time, when foreigners had learned to use this machinery, their lower wages would enable them to send cheaper shoes back to the United States. Of course it is true that the price of independence, for any American manufacturing industry subject to possible foreign competition, is unceasing progress. To hold its own, and to pay current high wages, it must not only have the lead, but keep the lead. It must continue to advance steadily, with new ways and better processes, as fast as competitors adopt its established improvements. The history of industry, and especially that of English industry in its long contest with foreign rivals, indicates that probably it can keep the lead. Imitative competitors usually remain in the rear. They are constantly left behind by those whose ways they copy. Certainly there is nothing to indicate that a different result has appeared or is impending as to those American manufactures which have long reached the stage of independence and of export, such as sewing-machines, tools and hardware, agricultural implements, electrical apparatus, and these very boots and shoes.

As has been the case with all the tariff acts since the Civil War, that of 1909 brought advances in the duties as well as reductions. Some of these advances were made in good faith for the purpose of getting more revenue; some were for the purpose of rectifying real or supposed errors or inconsistencies in previous acts;

and some were intended, openly or with subterfuges, to give additional protection.

On cotton goods advances were made both for rectification of old duties, and for the imposition of new. In some cases unexpected interpretations by the courts of the language of the act of 1897 had caused very low duties on certain cotton textiles. Certain changes, prepared for the purpose of making these rates about the same in range as those on other goods, were not unreasonable, and indeed, from the point of view even of a moderate protectionist, were imperative.¹ Other changes were made, however, with the avowed purpose of promoting some domestic industry and adding to the sweep of the protective system. The duty on mercerized cottons, already referred to, was advanced by imposing an extra cent per yard on goods treated by this process. The duties on certain grades of cotton hosiery, — seamless or fashioned hose — were advanced, chiefly on the cheaper grades.² A minor item, but one which caused some discussion, was the duty

¹ These changes were explained by Senator Aldrich, *Congr. Record*, p. 2847 seq. Analogous changes were made, for example, on pocket-knives, parts of knives (unassembled) being made dutiable at the same rates as completed knives.

² The rates on seamless, fashioned or shaped cotton hose stand thus in the acts of 1897 and 1909.

Classification	Duty of 1897		Duty of 1909	
Value up to \$1.00 a dozen	\$.50 c. a dozen, plus 15%	\$.70 c. a dozen, plus 15%
" 1.00 @ 1.50 " "	"	.60 " " "	"	.85 " " "
" 1.50 @ 2.00 " "	"	.70 " " "	"	.90 " " "
" 2.00 @ 3.00 " "	"	1.20 " " "	"	1.20 " " "
" 3.00 @ 5.00 " "	"	2.00 " " "	"	2.00 " " "
" over 5.00 " "	"	55%	"	55%

It will be seen that the increase is solely in the specific duties on the lower classes, and has most effect on the cheaper goods within each class.

To the paragraph (no. 328) containing these rates was added a new provision, imposing a duty on men's and boys' cotton gloves thus: —

Value up to \$6.00 per dozen, 50 cents per dozen, plus 40%
 " over " " " 50%.

The rate of duty obviously may be very high on the cheap gloves, valued say at \$1.00 per dozen. These goods were not separately enumerated in the act of 1897, nor in the House bill. The provision was inserted by the Senate, and is of the kind which may contain a "joker."

on razors, in which a very considerable increase was made.¹ By far the most important and systematic advance was that in the silk schedule. It will be remembered that in 1897 an elaborate system of specific duties on silks had been substituted for the previous ad valorem rates. In 1909 the House left unchanged the specific duties as fixed in 1897; but the Senate completely overhauled them. The silk schedule, intricate before, is now more intricate than ever, and only a person well versed in the trade can make out the meaning and probable effect of the changes. But it is clear on the face of it that the specific duties have been advanced throughout and that they have more and more taken the place of ad valorem duties, — a change no doubt of probable administrative advantage, but made the pretext here, as so often before, for a substantial increase in the effective rates.¹ It is noteworthy that neither in 1897 nor in 1909 was there any but the slightest discussion of the new silk duties. In 1897, when Mr. Dingley introduced the House bill containing them, he did not refer to this schedule. In 1909 they appeared for the first time in the Senate bill. There were no public hearings before the Senate Committee, and the new silk duties were the result of private conferences with the domestic producers, perhaps also with customs officials. They were not mentioned, or barely mentioned, when the Senate's bill was reported. Nor was much said about them in the debates. The intricacy of the schedule,

¹ The changes on razors were as follows. The specific duties throughout are per dozen.

Act of 1897		Act of 1909	
Value up to	\$1.50, duty 50 c. plus 15%	Value up to	\$1.00, duty 35%
"	1.50 to 3.00, " \$1.00 plus 15%	"	\$1.00 to 1.50, " .72 plus 35%
"	over 3.00, " \$1.75 plus 20%	"	\$1.50 to 2.00, " \$1.20 plus 35%
		"	\$2.00 to 3.00, " \$1.44 plus 35%
		"	over 3.00, " \$1.80 plus 35%

and the difficulty of making out its meaning, may account for this lack of discussion. It is certain that a systematic increase was made in a series of duties already very high.¹

All these are cases where duties already very high are put up still another notch. The question arises, why should imports have continued to flourish notwithstanding the previous high duties, and why should such extreme rates be demanded by the domestic producers? I suspect that the answer is much the same in all these cases. It is that the commodities are made by methods not adapted to American ways of efficiency. In this country manufacturing efficiency comes by the use of highly-developed machinery, continuous operation, standardized processes, and interchangeable parts. Where methods of this kind can be employed, the American employer can pay high wages and yet sell at low prices; very likely he can export. Where he uses much direct labor and few labor-saving appliances, where he tries to make few goods of any pattern, he cannot compete with the countries of

¹ One illustration will indicate the nature of the changes in the silk duties. In 1897 the duties on silk piece goods, weighing $1\frac{1}{2}$ to 8 ounces square yard, had been arranged in classes, the duty being so much on goods containing 20% and less of silk, more on goods containing 20% to 30% silk, still more if containing 30 to 45% of silk; then further differentiated according as they were or were not dyed or printed. In 1909 a new classification is made. Light-weight goods, $1\frac{1}{2}$ to $2\frac{1}{2}$ ounces per square yard, are set apart, and subject to higher duties; those weighing more, ($2\frac{1}{2}$ to 8 ounces) are also subjected to higher duties, though not in the same degree as the light-weight goods. The following are the changes on the cheapest goods containing the least percentage of silk:

1897	1909
Containing up to 20% of silk, weighing $1\frac{1}{2}$ to 8 oz. per yard, in the gum duty 50 c. lb. dyed or printed etc. ... " 60 c.	Containing up to 20% silk, weighing $1\frac{1}{2}$ to $2\frac{1}{2}$ oz. per yard, in the gum 70 c. lb. dyed or printed etc. ... 85 c. lb. The same, weighing $2\frac{1}{2}$ to 8 oz. per yard in the gum 57½ lb. dyed or printed etc. .70 c. lb.

Similar advances are made on all the classes, the duties rising as the percentage of silk becomes greater, and being throughout higher than the duties of 1897.

low wages and handicraft efficiency. Just why the American machine-using ways should be applied with success in some directions and should fail in others, is often difficult to explain, and indeed constitutes one of the most intricate problems in industrial history. The young industries argument may sometimes apply. The very introduction of the new branch into the country may turn invention in that direction and bring about the development of labor-saving processes. But the fact that extremely high duties are demanded is *prima facie* an indication that the field is not a promising one for this sort of development.

At all events, in all these cases of duties shoved higher and higher, great cost of direct labor was urged, — of course with the usual exaggeration and the usual jeremiads about the cheap labor of foreign countries. The seamless stockings on which duties were raised are of the kind not knitted complete by the marvellous self-acting machinery of the modern knitting frame. They need to be finished and shaped by hand; and this fact probably explains why they continue to be imported. Mercerized cottons, as one of the advocates of the duty said with emphasis,¹ call for an unusual amount of labor, and therefore — on the “true principle” — must have an unusually high duty. On silks, the duties are highest, and the importation at the same time most likely to continue, in case of the very cheap and the very dear classes of goods. The same is the case with many articles of hardware, such as pocket-knives. The explanation in both cases is that the medium grade goods, used and made in large quantities, give scope for machinery and standardized processes.

¹ See the speech of Senator Lodge, June 1; pp. 12, 13 of the separate pamphlet reprint of this speech.

It hardly need be said that no one explanation can fit all the complications of industry. The continuance of importations in the face of high duties sometimes is due to the simple fact that foreign producers are technically in advance, and the demand for still higher duties is pressed because the domestic producers have failed to keep abreast of them. While protection in the United States has not usually caused slackening of progress, it has in some cases done so. This is one of the most important questions of fact in regard to the increase or retention of a particular duty, but one which received no attention in the talk about cost of production and the "true principle." Razors, for example, seem to be made by more effective methods in Germany than in this country; although, as to the modern safety razor, the reverse is the case. In chemical products and dyes the Germans certainly have the lead, and higher duties seem to be simply props for the industrially inefficient.¹

On two of the most important schedules in the tariff virtually no change at all was made. The wool and woollen duties were left intact, except for a reduction in the duty on wool tops, and a slight reduction on yarns and dress goods.² Of these minor changes, the

¹ The House proposed to raise the duty on coal-tar colors from 30 to 35 per cent, but in the act it was finally left at 30 per cent. Mr. Payne, in advocating the House rate, was compelled to admit "I am sorry to have to confess it, but the truth is that the chemists in Germany beat the world. . . . Some enterprising men here wanted to go into the business. . . . But the Germans came in here and dumped colors in the market, and as often as our people succeeded in making the color and putting it on the market, the Germans came in and sold cheaper colors, or an equal color at a less price."

² The ad valorem duty on the cheaper grade of yarns was reduced from 40% to 35%, and the ad valorem duties on cotton-warp dress goods were also lowered by 5 per cent. The specific duties on these articles remain unchanged. The reductions bear in both cases on grades of goods not imported because the duties had been prohibitory; the changes signify nothing. On tops, which had before come in under a high drag-net clause, a considerable reduction was made both in the specific and ad valorem duties; but the rate still remains high enough to be prohibitory.

only one that caused discussion was that affecting tops. Wool tops are fibre in a stage toward yarn, intermediate between combing and spinning. They had been subjected to very high duties in previous acts under an omnibus clause (as wool "partly advanced in manufacture"), and attention had been directed to them by some published correspondence of 1897 between Mr. Whitman, the President of the Wool Manufacturers' Association, and the then Secretary of the Association, Mr. North.¹ Mr. Whitman, who was the head of the one great mill making tops for other spinners, desired in 1897 the retention of the duty on this product as well as the increase of duties on other products of the mill. He was aided in securing them by the fact that the Association Secretary, Mr. North, served also as confidential clerk of the Senate Finance Committee. The whole situation was one too familiar in our tariff history: the details of legislation had been virtually arranged by persons having a direct pecuniary interest in the outcome, and having also the closest relations with the legislators controlling the outcome. Even tho there be no corruption—and there is no ground for suspecting anything more than generous contributions to party chests—the outcome is much the same as if there had been corruption. It illustrates once more how radically bad is the method by which the details of our tariff legislation are settled.

No one ventured a word in criticism of the principle of a duty on raw wool. Some woollen manufacturers asked for a change in the method of assessing it, advocating an *ad valorem* duty, or one based on the varying shrinkage of the wool. They made out a strong

¹ This correspondence can be found in the Hearings before the Committee on Ways and Means, vol v, p. 5492.

case in favor of such a change. But the leading spirits in Congress were afraid to touch the complicated wool and woollens schedule. The duty on wool is the least defensible among the duties which are of real and considerable effect in our tariff system. On any of the grounds recognized by economists as possibly justifying a protective duty, it has not a leg to stand on. But it has enormous political strength. It is supposed to give the farmer a share of the benefits of protection, tho in fact the persons who benefit by it are chiefly the ranchers of the Far West. To tamper with it would endanger the allegiance to the wonder-working protective system in a section always disposed to be restive under it. So the duties on wool, and with them the huge structure of compensating and protecting duties on woollens, remained untouched.

Similarly the duty on sugar was left unchanged, except for a slight concession on one point where, as in the case of tops, unfavorable comment happened to be made at the time of the tariff debate. That point was the "differential," or extra duty on refined sugar, which operates as protection to the sugar refiners. Here there was a reduction from $12\frac{1}{2}$ cents per hundred pounds to $7\frac{1}{2}$ cents per hundred pounds. The American Sugar Refining Company, or "trust," happened to be in the public eyes for other reasons, and this change in duty was among the consequences. It is of very slight importance, in view of the cheapness of refining and the position of the trust in relation to its rivals. It will not affect imports or the price of sugar. On the other hand, the duty on raw sugar — vastly the most important part of the sugar duties — was left unchanged. Here again the champions of the farmers were much in evidence. The domestic beet-sugar growers were the vehement opponents of

any reduction, and made much of high cost of production as regards beets for the farmers and sugar for the manufacturers. The truth seems to be that in a state like Michigan, beet-sugar making cannot be carried on without a tariff prop; while farther west, especially in a state like Colorado, it needs none. The Michigan sugar people embarked in the business under the direct encouragement of the government. The Department of Agriculture has been preaching beet-sugar in season and out of season, for appropriate regions and for inappropriate: not unnaturally the growers were almost ferocious in their opposition to the proposal for reducing the duty on sugar.

One further change of possible importance was made in the sugar schedule. It was provided that 300,000 tons of sugar (roughly 10 per cent of the domestic consumption) might be admitted free of duty from the Philippine islands. This means simply a gift to the sugar producers of the Philippine islands of the amount previously chargeable as duty on their imports. The price paid for the sugar by American consumers will not fall in consequence of the remission; the price received by the Philippine planter will rise. The outcome will be the same, substantially, as from the free admission of sugar from the Hawaiian islands and Porto Rico, — a bounty of so much to the producers in the dependencies.¹ Whatever be our obligations to the people of these regions, I have never seen good ground for favoring any of them by such remission of duty. The feeling for it rests in good part on a confused notion, fostered by so much of the protectionist talk, that a duty is a burden on the foreign producer, not on the domestic consumer; and it is

¹ On the general working of this sort of favoritism, I refer the reader to my article, on "Sugar: a Lesson on Reciprocity and the Tariff" in the *Atlantic Monthly*, March, 1908, and to a supplementary note in this *Journal*, May, 1909.

urged that we should not treat the Philippine producers as foreigners. The truth is that while a duty brings ordinarily a burden on the domestic consumer, and its remission therefore brings ordinarily a relief for him, this sort of remission, being limited, redounds not to his advantage, but solely to that of the foreign producer. While the duty has been no burden to the latter, its remission by this process will bring a gain to him.

The most depressing part of the new tariff is in some of the petty items, important not in themselves but because of the mode in which they were dealt with. A constituent secures the ear of an influential Congressman or senator, proposes a high rate on an article he produces or wishes to produce, and gets it enacted by the log-rolling process. Where such changes concern important articles, like cottons, woollens, silks, hosiery, there is usually some public discussion and at least *pro forma* justification. But where minor articles are to be affected, the new rates are quietly put through without check or scrutiny. In the current session this was particularly the case in the Senate, since the Finance Committee of that body gave no public hearings and, among its own members, naturally carried senatorial courtesy to the limit. Thus the duty on some nippers and pliers was quietly advanced, for the benefit of a single manufacturer in New York, — in this case under the sponsorship of the Vice-President. The duty on cheap cotton gloves, such as are used by policemen, the militia, and the army for parade occasions, was virtually doubled, there being a projector who succeeded in getting the ear of a New England senator.¹ The duty on horn combs was raised

¹ This duty is a typical case of the "Joker." See the note to p. 27, above. My information in regard to this article, and in regard to nippers and pliers, comes from private sources, of whose trustworthiness I am assured.

from thirty to fifty per cent. The duty on woven fabrics of asbestos was raised in similar degree. Every one conversant with our tariff history knows that such items — concealed or obscure changes, working to the advantage of particular individuals — have been too common. But, to repeat, it is depressing to find that there are many of them in an act supposed to be in fulfilment of a pledge for downward revision.

A new set of provisions is found in the maximum and minimum arrangement. It is very simple. The stated tariff rates are declared to constitute the minimum tariff of the United States. To these rates 25 per cent is to be added, — 25 per cent not of the rates, but 25 per cent of the value of the articles imported, — on goods coming from countries which “unduly discriminate” against the United States. This undue discrimination may be either “in the way of tariff rates or provisions, trade or other regulations, charges, exactions, or in any other manner,” or by export bounty or export duty¹ or prohibition upon export. The minimum tariff plus this 25 per cent constitutes the maximum tariff. After March 31, 1910, the maximum tariff is to be applied unless the President has been satisfied that there is no “undue discrimination” against the United States. If so satisfied, he may by proclamation admit goods from a given country at the minimum tariff rates. The administration of the maximum and minimum

¹ The provision in regard to export duties, by which they may become the ground for levying the maximum tariff, was neither in the House bill nor in the Senate bill. “The words ‘or imposes no export duty’ were inserted in conference, and I believe were inserted at the suggestion of a few paper manufacturers in order to impose the maximum tariff on paper coming from the Province of Quebec.” Mr. Mann, *Congr. Record*, p. 5226. I do not know what grounds there may be for this suspicion. Cf. note to p. 22, above.

system is thus put entirely in the hands of the President.¹

On the other hand, the reciprocity arrangements provided for by the act of 1897 disappear entirely. The sections relating to reciprocity in that act are expressly repealed, and the President is given authority to terminate all agreements made under them. As these reciprocity agreements never had been of any substantial importance, their repeal is of little significance, except as indicative of the disappearance of any intention to deal with tariff questions in this way.

The maximum and minimum arrangement also is likely to have no substantial effect, nor is it expected to. This device, introduced by France in 1892, has had the same result as the previous most favored nation and treaty system. The minimum tariff became the really effective tariff. Maximum tariff is nothing more than a threat used against other countries when these make a move to apply their own maximum tariffs. France, as it happens, is the country against which, more than any other, the new arrangement in the tariff act of 1909 is directed. It is possible that ill temper, bad diplomacy, excess of protectionist and chauvinistic zeal, will bring about a commercial war with France or with other countries, and the application, by each against the other, of the maximum tariff. But the probabilities are that no such unfortunate result will ensue. The minimum tariffs

¹ The section containing the maximum and minimum provisions ends with this somewhat enigmatic clause: "To secure information to assist the President in the discharge of the duties imposed upon him by this section, and the officers of the Government in the administration of the customs laws, the President is hereby authorized to employ such persons as may be required." Under the authority here given President Taft has appointed the so-called Tariff Commission, of which Professor H. C. Emery is chairman. Under a liberal construction of the language of the statute, this body, as President Taft announced in his speech on the tariff at Winona, is to make inquiries not only as to foreign tariffs, but as to "cost of production abroad and here" and "the operation of the United States tariffs upon imports and exports."

are likely to be effective in the several countries, as they are intended to be; the maximum tariffs will be but empty threats. Nor will the minimum tariffs bring any relaxation of the protective systems in the several countries. The minimum duties, in the United States as elsewhere, are as high as their supposed interests demand. The whole arrangement means a possible tightening of tariff restrictions, but in no case any relaxation.

The act of 1909 brings no essential change in our tariff system, and indicates no essentially different spirit in dealing with it. It still leaves an extremely high scheme of rates, and still shows an extremely intolerant attitude on foreign trade. The one change of appreciable importance is the abolition of the duty on hides. As an offset to this are the increased duties on cottons and silks, and on a number of minor articles. Most disappointing is the mode in which the subject was dealt with. There was the same pressure from persons engaged in industries subject to foreign competition, the same willingness to accede to their demands without critical scanning. In the House, under the leadership of Mr. Payne, there was an endeavor both to maintain publicity, and to prevent such concealed items. In the Senate, things went in star-chamber fashion, and the familiar process of log-rolling and manipulation was once again to be seen. The act as finally passed bears in its details the impress much more of the Senate than of the House. It certainly means no real breach in the tariff wall, and no downward revision of any serious consequence.

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AMERICAN SHOEMAKERS, 1648-1895 A SKETCH OF INDUSTRIAL EVOLUTION¹

SUMMARY

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THE boot and shoe makers, either as shoemakers or "cordwainers," have been the earliest and the most strenuous of American industrialists in their economic struggles. A highly skilled and intelligent class of tradesmen, widely scattered, easily menaced by commercial and industrial changes, they have resorted with determination at each new menace to the refuge of protective organizations. Of the seventeen trials for conspiracy prior to 1842, the shoemakers occasioned nine. Taking the struggles of this harassed trade, it is possible to trace industrial stages by American documents from the gild to the factory. Organizations whose records give us this picture of industrial evolution under American conditions are the "Company of Shoemakers," Boston, 1648; the "Society of the Master Cordwainers," Philadelphia, 1789; the "Federal Society of Journeymen Cordwainers," Philadel-

¹ In the collection of material for this article I have been aided by the American Bureau of Industrial Research and the Carnegie Institution of Washington.

phia, 1794; the "United Beneficial Society of Journeymen Cordwainers," Philadelphia, 1835; the Knights of St. Crispin, 1868; the Boot and Shoe Workers' Union, 1895. Each of these organizations stands for a definite stage in industrial evolution from the primitive itinerant cobbler to the modern factory; each represents an internal contention over the distribution of wealth provoked by external conditions of marketing or production; each was productive of written documents preserving to us the types of social organization that struggled for adaptation to the evolving economic series.

I

"THE COMPANY OF SHOOMAKERS," BOSTON, 1648

Probably the first American gild was that of the "shoomakers of Boston," and its charter of incorporation, granted by the Colony of the Massachusetts Bay, on October 18, 1648, is the only complete American charter of its kind, of which I have knowledge.¹ The coopers were granted a similar charter on the same date. The act recited that on petition of the "shoomakers" and on account of the complaints of the "damage" which the country sustained "by occasion of bad ware made by some of that trade," they should meet and elect a master, two wardens, four or six associates, a "clarke," a sealer, a searcher, and a beadle, who should govern the trade. The "commission" was to continue in force for three years.

A contemporary reference to this incorporation of shoemakers is that of Edward Johnson, in his *Wonder-*

¹ I am indebted to Rev. C. W. Blackett of Medford, Mass., for calling my attention to this gild charter. It will be found in the Records of the Colony of the Massachusetts Bay in New England, Vol. 3, p. 132. See Appendix I.

Working Providence of Sion's Savior in New England, 1651. Speaking of the material progress of the colony and the rapid division of labor he says,¹ "all other trades have here fallen into their ranks and places, to their great advantage; especially Coopers and Shoemakers, who had either of them a Corporation granted, enriching themselves by their trades very much."

In the charter of the Boston gild, the main object of the shoemakers was the suppression of inferior workmen who damaged the country by "occasion of bad ware." The officers were given authority to examine the shoemakers and to secure from the courts of the colony an order suppressing any one whom they did not approve "to be a sufficient workman." They were also given authority to regulate the work of those who were approved and thus to "change and reforme" the trade and "all the affayres thereunto belonging." And they were erected into a branch of government with power to annex "penalties" and to "levy the same by distress."

At the same time it is evident that the colonial authorities took pains to protect the inhabitants from abuse of these powers by placing their determination "in cases of difficulty" in the hands of the judges of the county, and by allowing appeals to the county court. The two substantial reservations which the colony withholds from the company are the "inhanding the prices of shooes, bootes, or wages," and the refusal to make shoes for inhabitants "of their owne leather for the use of themselves and families," if required by the latter.

From these reservations we are able to infer the industrial stage which the industry had reached at the

¹ Collections of the Massachusetts Historical Society, Vol. III, 2d Series, p. 13, Boston, 1826.

time of incorporation.¹ It was the transition from the stage of the itinerant shoemaker, working up the raw material belonging to his customer in the home of the latter, to the stage of the settled shoemaker, working up his own raw material in his own shop to the order of his customer. The reservation for the protection of inhabitants is suggestive of statutes of the 15th and 16th centuries imposing penalties on gild members who refused to work in the house of their customer.² The fact that the colony, while granting power to reform the trade, nevertheless thought it necessary to require the shoemaker to continue to work up the leather owned by his customer, altho conceding that he need not go to the house of the customer, indicates the source of the abuses from which the shoemakers were endeavoring to rid themselves. The itinerant was likely to be poorly trained and he could escape supervision by his fellow craftsmen. He was dependent on his customer who owned not only the raw material, but also the workplace, the lodging, and the food supplies of the shoemaker, leaving to the latter only the mere hand tools. He worked under the disadvantage of a new workplace for each new order, without the conveniences and equipment necessary for speedy and efficient work. He had to seek the customer, and consequently was at a disadvantage in driving a bargain. This made him, however, a serious menace to the better trained shoemaker working in his own shop and on his own material, but waiting for the customer to come.

The Boston gild represented the union in one person of the later separated classes of merchant, master, and

¹ See Bücher, *Die Entstehung der Volkswirtschaft*. (Citations are from Wickett's translation, *Industrial Evolution*, New York, 1901.) Also Sombart, *Der Moderne Kapitalismus*, I: 93-94.

² Bücher, 169.

journeyman. Each of these classes has a different function. The merchant-function controls the kind and quality of the work, and its remuneration comes from ability to drive the bargain with the customer in the process of adjusting price to quality. The master-function, on the other hand, controls the workplace and the tools and equipment, and passes along to the journeyman the orders received from the merchant. Its remuneration comes from management of capital and labor. The journeyman-function, finally, is remunerated according to skill and quality of work, speed of output, and the amount and regularity of employment.¹

Thus, from the standpoint of each of the functions that later were separated, did this primitive gild in self-interest set itself against the "bad ware" of the preceding itinerant stage. From the merchant standpoint the exclusion of bad ware removed a menace to remunerative prices for good ware. From the master standpoint the exclusion of the itinerant transferred the ownership of the workshop and the medium of wage payments from the consumer to the producer. From the journeyman standpoint, this exclusion of the itinerant eliminated the truck-payment of wages in the form of board and lodging by substituting piece wages for a finished product. And this control of the finished product through all the stages of production gave a double advantage to the craftsman. It transferred to him the unskilled parts of the work hitherto done by the customer's family, thus enabling him at one and the same stroke both to increase the amount of his work and to utilize the bargaining leverage of his skill to get skilled wages for unskilled work.

¹ Appendix II, showing industrial stages, classes, and organizations, should be consulted in reading this and the following analysis.

By this analysis we can see that when the three functions of merchant, master, and journeyman were united in the same person, the merchant function epitomized the other two. It is the function by which the costs of production are shifted over to the consumer. The master looks to the merchant for his profits on raw material, workshop, tools, and wages, and the journeyman looks to him for the fund that will pay his wages.

Now, there is a prime consideration in the craft-gild stage that enhances the power of the merchant to shift his costs to the consumer. This is the fact that his market is a personal one and the consumer gives his order before the goods are made. On the other hand, the bargaining power of the merchant is menaced by the incapacity of customers accurately to judge of the quality of goods as against their capacity clearly to distinguish prices. Therefore, it is enough for the purposes of a protective organization in the custom-order stage of the industry to direct attention solely to the quality of the product rather than the price or the wage, and to seek only to exclude bad ware and the makers of bad ware. Thus the Boston shoemakers and coopers, though enlisting the colonial courts only in the laudable purpose of redressing "the damage which the country sustains by occasion of bad ware," succeeded thereby in "inriching themselves by their trades very much." In this they differed from later organizations, based on the separation of classes, to whom competition appeared as a menace primarily to prices and wages and only secondarily to quality.

II

THE SOCIETY OF MASTER CORDWAINERS, 1789, AND
THE FEDERAL SOCIETY OF JOURNEYMEN CORD-
WAINERS, 1794, PHILADELPHIA

The separation of classes first appears in the case of the cordwainers of Philadelphia, a century and a half later. Here appeared the first persistent discord that broke the primitive American harmony of capital and labor. So intense were the passions aroused and so widespread was the popular irritation, that they have left their permanent record in one hundred and fifty-nine pages of "The Trial of the Boot and Shoemakers of Philadelphia, on an indictment for a combination and conspiracy to raise their wages."¹ Here we have a fairly full record of the first American association of employers and the first trade union. They were the "Society of the Master Cordwainers of the City of Philadelphia," 1789, and the "Federal Society of Journeymen Cordwainers" of the same city, organized in 1794.

Other journeymen may have had organizations prior to that time. Mr. Ethelbert Stewart² has, indeed, unearthed records showing that the printers in New York as early as 1776 and in Philadelphia as early as 1786 were organized for the purpose of supporting their demands by means of strikes. But these were temporary organizations, falling apart after a brief strike; whereas the cordwainers of Philadelphia in 1799 conducted a strike and lockout of nine or ten

¹ It is planned to reprint this and other documents referred to under the auspices of the American Bureau of Industrial Research and the Carnegie Institution of Washington, in the Documentary History of American Industrial Society, published by A. H. Clark & Co., Cleveland, Ohio.

² U. S. Bulletin of Labor. No. 61, p. 860.

1648
150
848

weeks. To them goes the distinction of continuing their organization for at least twelve years and aggressively driving their demands at the end of that period to the extent that the public took notice, and the employers sought refuge behind the arm of the law. And it is to this junction of popular excitement and judicial interposition that we owe the record which exhibits this earliest struggle of capital and labor on American soil.

The indictment charged the journeymen with conspiring not to work except at prices and rates in excess of those "which were then used and accustomed to be paid and allowed to them;" with endeavoring "by threats, menaces and other unlawful means" to prevent others from working at less than these excessive prices; and with adopting "unlawful and arbitrary bye laws, rules and orders" and agreeing not to work for any master who should employ any workman violating such rules, and agreeing "by threats and menaces and other injuries" to prevent any workman from working for such a master.

The conspiracy and strike occurred in November, 1805, and the matter came to trial in the Mayor's court in March, 1806. The court permitted the witnesses to recite the entire history of this and the preceding strikes as well as the history of the preceding combinations both of journeymen and employers. Consequently we are able to trace from the year 1789 to the year 1806 the development of the boot and shoe industry in Philadelphia, along with the accompanying separation of the interests of the journeymen from those of the masters.

I do not find any record of a guild organization like that in Boston, but there had been a "charitable society" to which both employers and journeymen

belonged, and this was still in existence in 1805.¹ It was the masters who first formed themselves, in April, 1789, into a separate organization. Their early constitution was laid before the court, showing the purpose of their organization to be that of "taking into consideration the many inconveniences which they labour under, for want of proper regulations among them, and to provide remedies for the same."² They were to "consult together for the general good of the trade, and determine upon the most eligible means to prevent irregularities in the same." They were to hold four general meetings each year, and they had a committee of seven "to meet together as often as they think necessary." The society terminated in 1790, after the fifth quarterly meeting.

Apparently the masters had at that time just two kinds of "inconveniences": the competition of cheap grades of goods offered for sale at the "public market," and the competition of masters who offered bargain prices by public advertisement. This is shown by their qualifications for membership. "No person shall be elected a member of this society who offers for sale any boots, shoes, &c., in the public market of this city, or advertises the prices of his work, in any of the public papers or hand-bills, so long as he continues in these practices."

Evidently this society of masters was not organized as an employers' association, for nothing is said of wages or labor. It was organized by the masters merely in their function of retail merchant. The attorneys for the journeymen tried to make out that when the latter organized separately in 1794 they did so in self-defense, as against the masters' association, and they contended that in the masters' constitution

¹ Trial, p. 34.

² Trial, p. 60.

were to be found "ample powers" not only to regulate prices but also "to form a league to reduce the wages of their journeymen."¹ And, altho they admitted that the association had terminated in 1790, yet they held "it was a Phoenix that rose from its ashes."² But it was brought out clearly in evidence that the subsequent resurrections in 1799 and 1805 were provoked by the journeymen's aggressive society and were but temporary organizations. The Phoenix that kept on repeatedly rising was not the one that had disappeared. In 1789 it had been an organization of masters in their function of retail merchant. In its later stages it was an organization of masters in their function of employer. The distinction, fundamental in economics, caused a re-alignment in *personnel*, as will be shown presently. The early organization regulated prices and followed the vertical cleavage between producer and consumer. The later organization regulated wages and followed the horizontal cleavage between employer and laborer. In the early organization the journeyman's interest was the same as the master's. In the later ones the journeyman's interest was hostile to both consumer and master.

The foregoing considerations, as well as the transition to later stages, will become more apparent if we stop for a moment to examine the economic conditions that determine the forms of organization. These conditions are found, not so much in the technical "instruments of production," as in the development of new markets. The economic development of the market proceeded as follows: The cordwainer of the Boston gild made all his boots and shoes to the order of his customer, at his home shop. His market was

¹ Trial, p. 92.

² Trial p. 61, 99.

a custom-order market, composed of his neighbors. His product, in the terminology of 1806, was a "bespoke" product. He was in his own person master, custom-merchant, and journeyman.

Next, some of the master cordwainers begin to stock up with standard sizes and shapes, for sale to sojourners and visitors at their shops. They cater to a wider market, requiring an investment of capital, not only in raw material but also in finished products and personal credits. They give out the material to journeymen to be made up at their homes and brought back to the shop. In addition to "bespoke work," the journeyman now makes "shop work" and the master becomes retail merchant and employer. This was the stage of the industry in Philadelphia in 1789 — the retail-shop stage.

Next, some of the masters seek an outside or foreign market. They carry their samples to distant merchants and take "orders" for goods to be afterwards made and delivered. They now become wholesale merchant-employers, carrying a larger amount of capital invested in material, products, and longer credits, and hiring a larger number of journeymen. In addition to "bespoke" and "shop" work the journeyman now makes "order work" for the same employer. This is the wholesale-order stage of the industry.

This was the stage in Philadelphia in 1806. At that time we find the journeyman engaged on one kind and quality of work, with the same tools and workshops, but with four different destinations for his product. Each destination was a different market, with a different level of competition, leading ultimately, after a struggle, to differences in quality. The terms employed at the time recapitulate the evolution of

the industry. "Bespoke work" recalls the primitive custom market of the Boston gild, now differentiated as the market offered by the well-to-do for the highest quality of work at the highest level of competition. "Shop work" indicates the retail market of less particular customers at a wider but lower level of competition and quality. "Order work" indicates a wholesale market made possible by improved means of transportation, but on a lower level of strenuous competition and indifferent quality projected from other centers of manufacture. "Market work" — i. e. cheap work sold in the public market — indicates the poorest class of customers and consequently the lowest level of competition, undermining especially the shop-work level, and, to a lesser degree, the order-work level, but scarcely touching the "bespoke" level.

It was the widening out of these markets with their lower levels of competition and quality, but without any changes in the instruments of production, that destroyed the primitive identity of master and journeyman cordwainers and split their community of interest into the modern alignment of employers' association and trade union. The struggle occurred, not as a result of changes in tools or methods of production, but directly as a result of changes in markets. It was a struggle on the part of the merchant-employer to require the same *minimum quality* of work for each of the markets, but lower rates of wages on work destined for the wider and lower markets. It was a struggle on the part of the journeymen to require the same *minimum wage* on work destined for each market, but with the option of a higher wage for a higher market. The conflict came over the wage and quality of work destined for the widest, lowest, and newest market.

This will appear from the evidence brought out at the trial.

In the Boston gild it does not appear that there were any journeymen. Each "master" was at first a traveller, going to the homes of his customers and doing the skilled part of the journeyman's work. Next he was the all-round journeyman, not only "his own master" but, more important, his own merchant. The harmony of capital and labor was the identity of the human person. The market was direct, the orders were "bespoke."

Even in Philadelphia in 1789, when the masters had added "shop work" and had separated themselves out as an association of retail merchants, the interests of the journeymen coincided with theirs. The journeymen were even more distressed by "market work" than were the masters. At the "market" there was no provision for holding back goods for a stated price. Everything had to be sold at once and for cash. Goods were not carried in stock. Consequently the prices paid were exceedingly low. Job Harrison, the "scab," testified that, whereas he was regularly paid 9s. for making a pair of shoes, he could get only 3s. to 3s. 6d. on "market work." If he should quit his job by joining the "turn-out" under orders from the society he would be "driven to market work," at which he could not get half a living.¹ So also declared Andrew Dunlap and James Cummings, members of the Society who had resorted to "market work" during the turn-out.² The journeymen's society, in its contest with the masters, permitted its members to send their product to the public market, or to work for merchants who supplied that market. The society members, like Dunlap and Cummings, pieced out their strike

¹ pp. 13, 20.

² pp. 27, 32.

benefits and what they could get by "cobbling," with what they could get at "market work."¹ "You were at liberty to make market work, or any other work you could get, except of master workmen?" "Yes," was the answer of Job Harrison.² This was evidently a war measure, and not an indication that the journeymen were less hostile than the retail merchant towards the public market.

The two other kinds of work that prevailed in 1789 were "shop" work and "bespoke" work. The prices paid to the journeymen for these two kinds of work were originally the same. If they differed in quality the difference was paid for at a specific price for extra work, as when Job Harrison got six pence extra a pair if he would "side line" his shoes with silk.³ But the payment for extras was the same for shop work as it was for "bespoke" work. The same workman made both, and made them in the same way, with the same tools. One of the grievances of the journeymen was the innovation attempted in 1798 by one of the employers to reduce the price of shop work. "I made some work for Mr. Ryan" said John Hayes, "and he made a similar reduction upon me, because they were to go into the shop, when he used before to give the same price for shop goods, as he did for bespoke work."⁴ The society demanded similar pay for similar work, whether shop or bespoke. "None are to work under the price," said Keegan, a member of the committee that met the employers; "a good workman may get more."⁵

Thus the journeymen were at one with the masters in their opposition to "market work." For the journeyman it was a menace to his wages on shop work.

¹ pp. 20, 20.

² p. 24.

³ p. 24.

⁴ p. 12.

⁵ pp. 20, 20.

For the master it was a menace to his business as a retail storekeeper.

It was the third, or "export" stage of the market, with its wholesale "order" work, that separated the interests of the journeyman from those of the master. Here the retail merchant adds wholesale orders to his business. We find John Bedford describing the way in which he branched out:¹

"Sometime afterward [1799], my little capital being laid out in stock, and no way of mending it at home, an idea struck me of going to the southward, and endeavor to force a sale. I went to Charleston at the risque of my life, for the vessel in which I went had like to have been lost at sea. I put my articles at an extremely low price, by which I had but little profit, in order to induce people to deal with me. I got two customers at Charleston; from there I went to Norfolk, Petersburg, Richmond and Alexandria . . . I returned with two or three small orders . . . business became a little brisk and the journeymen turned out again; on which account I was forced to raise the price of the work I had stipulated to perform."

He goes on to specify the loss of four customers and "the sale of 4000 dollars" worth per year.

Six years later Wm. Montgomery was doing an "export" business. He said:²

"I had at that time [1805] order work from St. Thomas's, New Orleans, and Charleston, to the amount of 2000 dollars, but I could not afford to give the rise of wages, without a loss in executing those orders."

Also Lewis Ryan:³

" . . . Barnes and Snyder called on me [1805], and asked if I would give the new prices? I answered yes; but as I had determined to relinquish order-work, it should be to the best workmen, and that only for bespoke work."

On the other hand, employers who were not branching out for export work were willing to pay the wages

¹ pp. 35, 36.

² p. 40.

³ p. 41.

demanding and unwilling to join the employers' association. Wm. Young¹ had belonged to the masters' association in 1789, when it was only a retail merchants' association, and in 1805 he was still doing only bespoke and shop work.

Two of the journeymen waited on me together, [he said]: they informed me that they felt themselves aggrieved, and had determined to ask higher prices; a list of which they showed me. I told them I had been in the habit of giving those prices three months before. Q. Did the master workmen call on you? A. Yes: I told them I could not retract with propriety, as I had been a long time giving the very wages for which the journeymen turned out. . . . The gentlemen, when they called upon me, tried to make some influence upon me to discharge my workmen: I told them I could not do it with propriety.

On the other side, the journeymen who did only bespoke and shop work, were not inclined to stand by the union for the increase in prices. Job Harrison said,² "if shoes were raised to 9s. I should not be benefited for I had that price already, but you know it cannot be given only on customers' work." Afterwards he was asked:

Did I understand you to be satisfied all this time with the wages you had been accustomed to receive from Mr. Bedford, and yet they compelled you to turn out? A. I had as much as any man, and I could not expect more: but they did not compel me to turn out, any other way than by making a *scab* of me. . . . At length I received a note from Mr. Bedford, informing me that if I did not turn in to work I should hereafter have no more than common wages.³

The same was true of inferior workmen who could not command the wages demanded. These were doubtless kept on "order" work, and when the union demanded that the price on that work should be brought up to the same level as shop and bespoke

work, they secretly worked "under wages." The union had a committee, "to hunt up cases of the kind," and to demand of employers that such men be discharged.¹

Thus, as intimated above, the organization of the masters according to their employer-function, as compared with their former organization according to their merchant-function, caused a realignment of *personnel*. Both the employer and the workman on high-class custom-work "scabbed" on their respective class organizations struggling to control whole-sale-order work.

The several steps in this alignment of interests will appear in the history of the journeymen's society. The first society of the journeymen was organized in 1792, two years after the masters' society had dissolved. This was apparently a secret society. At any rate it did not submit a scale of prices to the employers, and did not call a strike, but merely contented itself with a "solemn" oath taken by each member to the effect, "I will support such and such wages, to the utmost of my power, &c." But a number of the journeymen secretly violated their pledge. "I know a number," testified Samuel Logan, at that time a journeyman, but now a master, "to work under wages they had solemnly promised to support . . . I therefore requested a repeal of this affirmation, which broke up the society."² The society dissolved in 1792, the year of its organization.

This society, however, must have had some effect on the price of shoes, for the price which had originally been 4s. 6d.³ had been raised to 6s. before 1794.

It was in 1794 that the permanent society was organized which continued until the time of the prose-

¹ p. 28.² p. 29.³ p. 52.

cution in 1806.¹ It secured in that year and again in 1796 an increase in the price of shoes, first, to something under \$1.00, then to \$1.00 a pair.² These increases affected, however, only shop and bespoke work, so that after 1796 the "settled price" was 7s. 6d; but Job Harrison, by making a lighter shoe with silk lining "so as to come nearer to the London dress-shoes," was paid 9s. a pair.³ At the other and lowest extreme, only "five elevenpenny bits" were paid for "order work." These prices prevailed until 1806. The bespoke and shop work was said to be sold to customers at \$2.75 a pair, but the order work was sold to retailers at \$1.80 a pair.⁴ Thus it was that for nominally the same quality of shoe the journeymen's society was able almost to double their wages on the custom and retail work, but had brought about an increase of only a few cents on the wholesale-order work. In other words, the employer as retail merchant gave to his employees an advance out of the advanced retail price of his goods, but as wholesale merchant he was not able to give a similar advance. Naturally the better class of workmen gravitated towards the custom and retail work, and the inferior workmen towards the wholesale work, so that what was originally the same quality of work, and nominally remained the same, became eventually different in quality.

This variation of price and quality is also observed in the price of boots. These had been advanced in price to the journeymen from \$1.40 per pair in 1792 to \$2.75 per pair in 1796. But the workmen conceded that they should make order work at \$2.50⁵ "in order to encourage the exportation trade."⁶ This was taken advantage of at the time of the cholera epidemic

¹ pp. 99, 134.

⁴ p. 23.

² pp. 11, 29.

⁵ p. 54.

³ pp. 12, 23.

⁶ p. 57.

in 1798 when the journeymen were paid only \$2.25.¹ After the journeymen returned to the city they organized their second strike, in 1798, for an increase. This was immediately granted by the employers, but in the following year, 1799, the employers effected an organization and ordered a return to the former wage. This caused the obstinate strike and lockout of nine or ten weeks, ending in a compromise. Again in 1804 there was another brief strike, at which the journeymen won, and the employers agreed to pay \$2.75. But after Christmas, when the work became slack, the price of order work was reduced to \$2.50.² This led to the obstinate strike of 1805, in which the journeymen demanded a flat increase all round to \$3.00 on both wholesale and retail work. But the employers had perfected their organization, and their list of prices made no mention of order work. The workmen lost the strike and were compelled to accept the employers' list. Consequently in 1806, as compared with 1789, the price paid to the journeyman on retail and custom work had advanced from \$1.40 to \$2.75, while the price on wholesale work of the same quality, after futile efforts of the journeymen to equalize it, was left open to individual bargains.³ Exactly as in the case of shoes, the differentiation in prices led to a differentiation in quality. The tendency of custom and retail work was towards improved quality, executed by superior workmen. The tendency of the wholesale work was towards inferior quality in the hands of inferior workmen. "At that time [prior to 1792] I believe we did not understand extra work in them, such

¹ p. 54.

² p. 56.

³ I am including here only the ordinary "long boots" and "cosacks." The society in 1805 also demanded an increase on the fancy kinds of work recently introduced. Trial, pp. 34, 51.

as they do now," testified James Keegan.¹ "I never do order-work, I am always paid the full wages."²

Notice now the characteristic features of the retail and wholesale-order stages of the industry. The master workman at the retail stage has added a stock of finished goods to his business of custom work. This requires a shop on a business street accessible to the general public with correspondingly high rents. It involves also a certain amount of capital tied up in short credits and accounts with customers. In his shop he has a stock of raw material, besides finished and partly finished goods. The merchant-function has thus become paramount, and has drawn with it the master-function. The two functions have equipped themselves with capital — merchant's capital in the form of finished stock, retail store, and short credits; employer's capital in the form of raw material undergoing manufacture by workmen under instructions. The journeymen are left with only their hand tools and their home workshop.

Thus the retail market has separated the laborer from the merchant. Labor's outlook now is solely for wages. The merchant's outlook is for quality and prices. But the separation is not antagonism. The employer-function is as yet at a minimum. Profit is not dependent on reducing wages so much as increasing prices. Indeed, the journeymen are able almost to double their wages without a strike, and the merchants pass the increase along to the customers.

But it is different when the merchant reaches out for wholesale orders. Now he adds heavy expenses for solicitation and transportation. He adds a store-room and a larger stock of goods. He holds the stock a longer time and he gives long and perilous credits.

¹ p. 52.

² p. 51.

At the same time he meets competitors from other centers of manufacture, and cannot pass along his increased expenses. Consequently the wage-bargain assumes importance, and the employer-function comes to the front. Wages are reduced by the merchant as employer on work destined for the wholesale market. The conflict of capital and labor begins.

Before we can fully appreciate the significance and the economic interpretation of these revolutionizing facts we shall need to consider the next succeeding stage, that of the merchant-capitalist.

III

THE UNITED BENEFICIAL SOCIETY OF JOURNEYMEN CORDWAINERS, PHILADELPHIA, 1835

The organizations of masters and journeymen of 1805 continued more or less until 1835. Then a new and more revolutionary stage of the industry is ushered in. This time it is the merchant-capitalist, who subdues both the master and the journeyman through his control of the new widespread market of the South and West. We read of his coming in the "Address to the Journeymen Cordwainers of the City and County of Philadelphia," issued by the two hundred members of the "United Beneficial Society of Journeymen Cordwainers."¹ This organization took the lead in bringing together the several trade societies of Philadelphia into the Trades' Union, and in conducting the first great general ten-hour strike in this country. The reasons for their aggressiveness may be inferred from their "Address." They recite that the wages of \$2.75 formerly paid for boots have fallen to \$1.12½; that

¹ *Pennsylvanian*, April 4, 1835.

their earnings of nine to ten dollars a week have fallen to four to six dollars; that, in order to earn such wages they must work, in many instances, fourteen hours a day; and that other skilled tradesmen are earning eight to twelve dollars a week, often "only working ten hours a day." This depression, they explain, has occurred since "a few years ago." It began with an "unfortunate" coöperative experiment of the journeymen in "opening shops for the manufacture of cheap goods" for the purpose of winning a strike. It was intensified by the appearance of the merchant-capitalist. We are told that

"The cunning men of the East," have come to our city, and having capital themselves, or joining with those who have had, have embarked in our business, and realized large fortunes, by reducing our wages, making large quantities of work, and selling at reduced price, while those who had served their time at the trade, and had an anxious desire to foster and cherish its interests, have had to abandon the business, or enter into the system of manufacturing largely [i. e., on a large scale] in order to save themselves from bankruptcy.

Then they explain how this has come about "without any positive reduction of our wages."

The answer is plain and simple — by making cheap work, triple the quantity has to be made to obtain a living; this produces, at dull seasons, a surplus of work in the market; and these *large* manufacturers taking advantage of the times have compelled their journeymen to make the work so far superior to the manner in which it was originally made for the wages given, that it is now brought into competition with first-rate work. This again lessens the quantity of first-rate work made, and the journeymen, formerly working for employers who gave them \$2.75 for each pair of boots made, are forced to seek employment of the very men who had ruined their business.

The dubious position of the employers also, at this stage of the industry, is shown by the action of "a large adjourned meeting of the ladies'-shoe dealers and

manufacturers." They unanimously adopted a preamble and resolution presented by a committee appointed at a previous meeting reciting that,

"Whereas, the laboring portion of this community have made a general strike for what they consider their just rights, knowing that if they were longer to permit the growing encroachments of capital upon labor, they would soon be unable to make any resistance . . . we feel a desire to aid and encourage them in their effort to obtain an adequate compensation for their labor. . . . Knowing that the pittance hitherto earned by them is entirely insufficient for their support, we do hereby agree to and comply with their demands generally, and pledge ourselves to do all in our power to support and sustain them. . . . Believing also that a trifling advance in the price of shoes would scarcely be felt by general society . . . we will agree to be governed hereafter by a list of prices for our work, which will render our business uniform and permanent."¹

Nine months later these employers were forced by the exactions of the union and their inability to control the merchant-capitalist to take the other side of the question, organizing as an employers' association and making a determined fight against the union.²

At this stage of the industry we have reached the market afforded by highway and canal, as well as ocean and river. The banking system has expanded, enabling the capitalist to convert customers' credits into bank credits and to stock up a surplus of goods in advance of actual orders. The market becomes speculative, and the warehouse of the wholesale-merchant-master takes the place of the store-room of the retail capitalist. The former master becomes the small manufacturer or contractor selling his product to the wholesale-manufacturer, the merchant-capitalist. The latter has a wide range of option in his purchase of goods and consequently in his ability to compel masters and journeymen to compete severely against each

¹ *Pennsylvanian*, June 15, 1835.

² *Pennsylvanian*, March 26, 1836.

other. He can have his shoes made in distant localities. The cordwainers relate¹ that

there are many employers of this city, who have made off of the labor of journeymen a liberal fortune, and now refuse to accede to the justice of our demands, and in order to evade the same they are preparing materials (in this city) in order to send them into the towns of the Eastern states (where living and labor are cheaper and workmanship not so good) to get the same made into shoes, then to be brought here and sold for Philadelphia manufacture.

The merchant-capitalist can also discover new fields for the manufacture of cheap work, and for the first time we read of the competition of convict labor. The cordwainers publish an advertisement,² warning their members against a firm who "are now getting work manufactured by convicts in the Eastern Penitentiary at less than one-half what our bill of rates call for. . . ." And one of their resolutions asserts that "shoemaking is found to be the most convenient and most lucrative employment of convicts, consequently almost *one-half* of the convicts in our different penitentiaries are taught shoemaking."³

The merchant-capitalist has also the option of all the different methods of manufacture and shop organization. He can employ journeymen at his warehouse as cutters, fitters, and pattern makers; he can employ journeymen at their homes to take out material and bring back finished work; but, more characteristic of his methods, he can employ small contractors, the specialized successors of the master cordwainer, who in turn employ one to a dozen journeymen, and by division of labor and "team work" introduce the sweating system.⁴

¹ Pennsylvanian, June 20, 1835. p. 2 c. 7.

² Pennsylvanian, Sept. 5, 1835.

³ Pennsylvanian, Oct. 1, 1835.

⁴ The term "manufactory," as distinguished from "factory," occurs in the merchant-capitalist stage to indicate the combined warehouse and place of employment where material is prepared to be taken out by journeymen or contractors. It is the "inside shop" of the ready-made clothing trade, the contractor's shops being known as "outside shops."

Through these different methods of manufacture we are able to see how it is that the merchant-capitalist intensifies and even creates the antagonism of "capital and labor." He does this by forcing the separation of functions and classes a step further than it had been forced in the wholesale-order stage. First, he takes away from the retail merchant his wholesale-order business. He buys and sells in large quantities; he assembles the cheap products of prison labor, distant localities, and sweat-shops; he informs himself of markets, and beats down the charges for transportation. Thus he takes to himself the wholesale business and leaves to the merchant the retail trade.

Second, he drives off from the retail merchant his employer-function. The retail merchant can no longer afford to employ journeymen on "shop" work, because he can purchase more cheaply of the merchant-capitalist. "A few years ago," say the Cordwainers in their "Address," "such an article as boots was unknown in the Market street shops: the manufacturing of that article being confined exclusively to those, who, having served an apprenticeship to the business, knew best its value."¹

Thus the merchant-capitalist strips the former merchant-master both of his market and his journeymen. The wholesale market he takes to himself; the journeymen he hands over to a specialist in wage-bargaining. This specialist is no longer known as "master," — he takes the name of "boss,"² or employer. He is partly a workman, having come up through the trade, like the master, and continuing to work alongside his men. He is an employer without

¹ Pennsylvanian, April 4, 1835.

² The first use that I have found of the Dutch word "bos," meaning manager of a group of workmen, is in the organ of the New York Trades' Union, "The Man," 1834.

capital, for he rents his workshop, and the merchant-capitalist owns the raw material and the journeymen own the tools. His profits are not those of the capitalist, neither do they proceed from his ability as a merchant, since the contract-prices he gets are dictated by the merchant-capitalist. His profits come solely out of wages and work. He organizes his workmen in teams, with the work subdivided in order to lessen dependence on skill and to increase speed of output. He plays the less skilled against the more skilled, the speedy against the slow, and reduces wages while enhancing exertion. His profits are "sweated" out of labor, his shop is the "sweatshop," he the "sweater."

Thus the merchant-capitalist, with his wide-spread, wholesale-speculative market, completes the separation and specializes the functions of the former homogeneous craftsman. The merchant-function, which was the first to split off from the others, is now itself separated into three parts, — custom merchant, retail merchant, wholesale merchant — corresponding to the three levels of market competition. The journeyman-function is now segregated on two levels of competition, the highest level of custom work and the lowest level menaced by prison and sweatshop work. The employer-function, the last to split off, makes its first appearance as a separate factor on the lowest level of market competition. Evidently the wide extension of the market in the hands of the merchant-capitalist is a cataclysm in the position of the journeyman. By a desperate effort of organization he struggles to raise himself back to his original level. His merchant-employers at first sympathise with him, and endeavor to pass over to their customers his just demand for a higher wage. But they soon are crushed between the level of prices and the level of wages.

From the position of a merchants' association striving to hold up prices, they shift to that of an employers' association endeavoring to keep down wages. The result of these struggles of protective organizations will appear when we analyze more closely the economic forces under which they operate. These forces turn on the nature of the bargain, the period and risk of investment, and the level of the competitive menace.

1. *The Nature of the Bargain*

We have to do with two classes of bargains, the wage-bargain and the price-bargain. Each is affected by the increasing distance of the ultimate purchaser, the actual consumer, from the worker, the manual producer. In the primitive "bespoke," or custom-order stage, the market is direct and immediate. The producer is the seller to the consumer. The work is priced by means of a separate bargain for each article. The price-bargain is made before the work is done. The customer pays according to the quality, and if he desires an improved quality, he stands the increased price; or, if the producers are able to exclude an inferior quality, he pays the price of the quality supplied. Hence an increase of wages is shifted directly to the purchaser. The wage-bargain and price-bargain are identical.

In the retail-shop stage, the producer is removed one step from the ultimate purchaser. The merchant intervenes as a price-bargainer. This bargain is made after the work is done. The purchasers are now separated into two classes, those who are particular about quality and adhere to the custom-order bargain, and those who are particular about price and pass on to the "shop" bargain. To the latter is transferred

a certain advantage, and the merchant is less able to shift upon them an increase in wages. The wage-bargain is made for a stock of shoes rather than an individual purchaser, and the goods are to be sold with reference to price rather than quality.

In the wholesale-order stage the market is removed a second step. There are two price-bargains that intervene between the worker and the market, one between the wholesaler and retailer, and one between retailer and consumer. The wholesale price-bargain is indeed made before the work is done, and to that extent the wages, if previously known, can be shifted. But the retailer, as shown above, is himself restricted in his ability to shift an increase upon the purchasers, and he is more concerned than they as to price because his profit turns thereon, while he is concerned with quality only indirectly as their representative and not directly as the actual user. Consequently the wholesale merchant is less able than the retail merchant to shift his wages. Of course, if an increase in wages is demanded after the orders are taken, he is compelled at once to make a fight against the workers. It was the opportunity offered by the wholesale-order stage to take this unfair advantage of the employer that provoked the first bitter struggle of capital and labor in 1806.

The wholesale-speculative stage of 1835 intrudes yet another step on the road from producer to market. The employer is now separated out from both the merchant and the worker, and, beside the wage-bargain, we have three price-bargains, — the employer-capitalist, capitalist-retailer, and retailer-consumer. The second bargain, that of capitalist-retailer, is made after the work is done, and it is this that constitutes its speculative character. It transfers the advantage

of position to the retailer, just as shop work had transferred the advantage to the consumer. Consequently, the employer, or "contractor," the sweatshop "boss," is now introduced as a specialist in driving the wage-bargain, with reference to the increased obstacles in the way of shifting wages along to the ultimate purchaser.

Thus it is that the ever-widening market from the custom-order stage, through the retail-shop and wholesale-order to the wholesale-speculative stage, removes the journeyman more and more from his market, diverts attention to price rather than quality and shifts the advantage in the series of bargains from the journeymen to the consumers and their intermediaries.

2. The Period and Risk of Investment

Throughout the four stages here described there have been no changes in the tools of production. The factory system with its "fixed capital" has not yet appeared, and the only capital invested is "circulating capital" in the form of raw material, finished stock, and bills receivable. Upon this circulating capital the owner incurs the threefold expense of interest, risk, and necessary profit. The amount of capital, per unit of product, remains the same, but the period during which it is locked up is lengthened in proportion as the market area is extended. In the custom-order stage this period is at its minimum; in the retail-shop stage the period is lengthened; in the wholesale-order stage, on account of long credits, the period is at its maximum; in the wholesale-speculative stage the average period is perhaps reduced, but this is more than offset by the increase in the rate of risk. This increase of expense for "waiting" and risk, owing to

the lengthening of the period of investment, must either be added to the price paid by the consumer or deducted from the wage paid to the producer. But since the position of purchasers in the price-bargains is improved with the progress of the stages, the increased expense on account of circulating capital must be met by deductions from the rates of wages. This might not have been necessary if fixed capital had been introduced, bringing with it a greater speed of output at the old amount of earnings. But, in lieu of this cheapening by improved tools of production, the only way of meeting the increased expense of waiting is by reducing the rate of pay on each unit of product. The wholesale market is a market for "future goods," the custom-order market is a market for "present goods." The premium on "future goods" appears therefore as a reduction below the wages paid at the same time on "present goods." Shop work, order work and speculative work must be manufactured at a lower wage-cost than bespoke work of the same kind and quality.

3. *The Level of the Competitive Menace*

Defining the "marginal producer" as the one with the lowest standards of living and cost and quality of work, he is the producer whose competition tends to drag down the level of others toward his own. It is not necessary that he be able actually to supply the entire market or even the greater part of it. His effect on others depends on the extent to which he can be used as a club to intimidate others against standing out for their side of the bargain. He is a menace rather than an actual competitor. Now, the extension of the market for the sale of goods is accompanied by

an extension of the field for the production of goods. This extension brings into the competitive area new competitors who are essentially a series of lower marginal producers. The capitalist who can reach out for these low-level producers can use them at will to break down the spirit of resistance of the high-level producers. In the custom-order stage there was but one competitive menace, the shoemaker who made "bad ware." In the retail-shop stage there is added the "advertizer," the "public market," and the auction system. In the wholesale-order stage there is added the foreign producer, and in the wholesale-speculative stage the labor of convicts and sweatshops. Thus the extension of the field of production increases the variety and discovers lower levels of marginal producers, and the merchant-capitalist emerges as the generalissimo, menacing in turn every part of the field from his strategic center.

4. *Protective Organizations*

We have already seen the cumulative effect in 1806 and 1835, of these three sets of circumstances in dragging down the entire body of workmen. We now proceed to notice the resistance of protective organizations and their ultimate effect in bringing about a segregation of work and workers on non-competing levels.

This may be seen by following again the movement of wages in Philadelphia from 1789 to 1835, on the different classes of work. Prior to 1792, on common boots, the journeyman's wages were \$1.40 a pair on both bespoke and shop work. In the course of fifteen years the price advanced to \$2.75, and this price was paid for both bespoke and shop work, but a concession of 25 cents was made on wholesale-order work,

bringing that price to \$2.50. In 1835 the price had fallen to \$1.12½ for wholesale work, while retail work had dropped out or had come down to the same price as wholesale work, leaving custom work at a higher figure. In the course of this movement, the better class of workmen restricted themselves as much as possible to custom work, and the quality of this kind of work was improved. On the other hand the wholesale-order and wholesale-speculative work tended throughout to fall into the hands of inferior workmen, and this brought about an inferiority in quality. These inferior goods, made by inferior workmen, became more and more a menace to the superior goods and the superior journeymen, both on account of the lower levels of the marginal producers and on account of the smaller demand relatively for the production of superior goods.

Herein was the necessity of protective organizations. In order that these organizations might succeed, it was just as necessary to set up protection against inferior goods as against low wages. In the gild stage of the industry, when the three functions of journeyman, master, and workman were united in one person, the protection sought was against the "bad ware" made by some of the trade. By "suppressing" those who made bad ware the customers would be compelled to turn to those who were "sufficient" workmen and made good ware. Since the bargain was a separate one for each article, so that the price could be adjusted to the quality before the work was done, nothing more was needed on the part of the gild members for the purpose of "inriching themselves by their trades very much."

But in the later stages of the industry the merchant-function, and afterwards the employer-function, were

separated from the journeyman-function. It is the special function of the merchant to watch over and guard the quality of the work, because his bargain with the consumer is an adjustment of the price to the quality demanded. The journeyman's function is simply that of making the kind and quality of goods ordered by the merchant. The merchant, in his function as employer, gives these orders to the journeyman and consequently, when the employer-function is separated from the journeyman-function, the employer, as the representative of the merchant, attends to the quality of the work. In this way the journeyman has lost control over quality, and is forced to adapt his quality to his price, instead of demanding a price suited to his quality. So, when he forms his protective organization his attention is directed mainly to the compensation side of the bargain. In proportion as the quality of his work depends on his rate of pay he indirectly controls the quality, but the primary purpose of his organization is to control the rate of pay. This he does, first, by demanding the same minimum rate of pay for all market destinations of the same kind of work. It was this demand that forced the alignment of classes, and drove the sympathetic merchant over into the hostile employers' association. The employer could yield if he confined himself to the narrow field of the "bespoke" market, but not if he was menaced by the wider field of the wholesale market. On this account it was possible in the retail-shop stage for the interests of employer and workmen to be harmonious. But the employer could not yield in the merchant-capitalist stage, on that part of the field menaced by prison and sweatshop labor. Consequently the outcome of the strikes of 1835 was the differentiation of the market into two non-competing

levels, the higher level of custom and high-grade shop work, controlled more or less by the cordwainers' societies for the next twenty-five years,¹ and the lower level of inferior work controlled by prison and sweat-shop competition.²

IV

KNIGHTS OF ST. CRISPIN, 1868

We come now to an entirely different step in the progress of industrial stages. Hitherto the only change requiring notice has been that produced by the extension of the market and the accompanying credit system. These changes were solely external. The next change is internal. Prior to 1837 there had been scarcely a hundred inventions affecting the tools used by the cordwainer. All of these may be described as "devices" rather than machines. Even as late as 1851 all of the labor in the manufacture of shoes was hand labor. In 1852, the sewing machine was adapted to the making of uppers, but this did not affect the journeyman cordwainer, because the sewing of uppers had been the work of women. Even the flood of inventions that came into use during the decade of the 'fifties were aids to the journeyman rather than substitutes for his skill. Indeed some of them probably operated to transfer the work of women to men, for

¹ Freedley, E. T., *Philadelphia and its Manufactories*, p. 187, says in 1858: "Making men's wear and making women's wear are distinct branches . . . The Men's men and Women's men, as the workmen are distinguished, have separate organisations, and neither know nor mingle with each other."

² "In addition to these there are a large number whose operations, though in the aggregate important, cannot easily be ascertained. They are known by a term more expressive than euphonious, 'garret bosses' who employ from one to twelve men each; and having but little capital, make boots and shoes in their own rooms, and sell them to jobbers and retailers in small quantities at low rates for cash. One retailer, who sells \$20,000 worth per annum, buys three-fourths of his stock from these makers." Freedley, p. 188.

they required greater physical strength and endurance in order to develop their full capacity. Whether operated by foot power or merely facilitating the work of his hands, they were essentially shop tools and not factory machines. Such were the tin patterns for cutting, the stripper and sole-cutter, adjustable lasts, levellers, skivers, and the machines for heel making, lasting, and sandpapering. Quite different were the pegging machine introduced in 1857, and especially the McKay sole-sewing machine, introduced in 1862. These usurped not only the highest skill of the workman but also his superior physique. The McKay machine did in one hour what the journeyman did in eighty. These machines were quickly followed by others, either machines newly invented or old ones newly adapted, but all of them belted up to steam. The factory system, aided by the enormous demand of government for its armies, came suddenly forth, though it required another fifteen years to reach perfection. It was at the middle of this transition period, 1868 to 1872, that the Knights of St. Crispin appeared, and flourished beyond anything theretofore known in the history of American organized labor. Its membership mounted to 40,000 or 50,000, whereas the next largest unions of the time claimed only 10,000 to 12,000. It disappeared as suddenly as it had arisen, a tumultuous, helpless protest against the abuse of machinery. For it was not the machine itself that the Crispins were organized to resist, but the substitution of "green hands" for journeymen in the operation of the machines. There was but one law which they bound themselves by constitutions, rituals, oaths, and secret confederacy to enforce and to support each other in enforcing: refusal to teach green hands except by consent of the organization. This at least was the

object of the national organization. When local unions once were established, they took into their own hands the cure of other ills, and their strikes and lockouts were as various as the variety of shops and factories in which they were employed. The Knights of St. Crispin were face to face with survivals from all of the preceding stages of industrial evolution, as well as the lusty beginnings of the succeeding stage. They were employed in custom shops, in retail and wholesale-order shops, in the shops of the merchant-capitalist and his contractors, in the factories of the manufacturer-capitalist. A comparison of the objects of their strikes reveals the overlapping of stages. All of their strikes turned directly or indirectly on two issues, resistance to wage reductions and refusal to teach "green hands." The wage strikes took place mainly in the shops of the merchant-capitalist, the "green hand" strikes in the factories.¹ The merchant-capitalist was forced by the competition of the manufacturer, either to become a manufacturer himself (or to purchase from the manufacturer), or to cut the wages of his journeymen and the prices paid to his contractors. Neither the journeyman's devices nor his foot-power machines yielded a sufficient increase of output to offset his wage reductions. His aggravation was the more intense in that the wage reductions occurred only on shop work and not on custom work. The anomaly of different prices for the same grade of work, which had showed itself with the extension of markets, was now still more exaggerated and more often experienced under the competition of factory products. Even prison labor and Chinese labor were not cheap enough to enable the merchant-capitalist to compete with the product of green hands and steam power.

¹ For the detailed study upon which this brief summary of the Knights of St. Crispin is based I am indebted to Mr. D. D. Leschier, member of my research group.

The factory succeeded also in producing a quality of work equal or even superior to that produced by the journeyman. Consequently its levelling agencies reached upwards to all but the topmost of the non-competing levels on which the journeymen had succeeded in placing themselves, and brought them down eventually to its own factory level. The Grand Lodge of the Knights of St. Crispin was the protest of workmen whose skill of work, quality of product, and protective unions had for a generation preceding saved for themselves the higher levels of the merchant-capitalist system against the underwash of prison and sweatshop competition. It was their protest against the new menace of cheap labor and green hands utilized by the owners of steam power and machinery.

It is not my purpose here to describe the familiar factory system. Its place in the evolution of industrial stages is summarized in the appended table. Suffice it to note that in the shoe industry the factory system was established in substantially its present form in the early part of the 'eighties; that detailed piece-work has taken the place of team-work and hand-work; that the last vestige of property-right has left the worker; that the present form of labor organization, the Boot and Shoe Workers' Union, has endeavored, since 1895, to bring together all classes of employees, men and women, in a single industrial union rather than a partial trade union; and that the two classes of protective organizations have asserted their political power for protection against low levels of competition, the merchant-manufacturer against free trade in foreign products, the wage-earner against foreign immigrants, prison labor, child labor, and long hours of labor.

V

INDUSTRIAL EVOLUTION IN EUROPE AND AMERICA.
ORGANIZATION AND LEGISLATION FOR PROTECTION

The foregoing sketch of industrial evolution in America brings into prominence the part played by the ever-widening area of competition and the effort of protective organizations to ward off the peculiar competitive menace of each stage of development. From this standpoint the sketch may be compared with the investigations of Marx, Schmoller, and Bücher. Karl Marx was the first to challenge the world with a keen analysis of economic evolution, but his standpoint is that of the mode of production and not the extension of the market. His two assumptions of a given "use value" and a given "average social labor" serve to obliterate, the one the part played by the price-bargain, the other the part played by the wage-bargain. With these assumptions out of the way he is able to concern himself with the production of "surplus value" by his theory of the working day and the cost of living. But these are secondary factors, results not causes. The primary factors are on the side of the market, where competition is carried on at different levels. Instead of "exploitation," growing out of the nature of production, our industrial evolution shows certain evils of competition imposed by an "unfair" menace. Instead, therefore, of an idealistic remedy sought for in common ownership, the practical remedy always actually sought out has been the elimination of the competitive menace through a protective organization or protective legislation.

Schmoller and Bücher have both avoided the narrow abstractions of Marx, because they have traced out the actual development of industry through access to a wealth of historical material not available to their predecessor. Schmoller with his ever-widening area of village, town, territory, and state under a single political control leading to extension of markets,¹ and Bücher with his ever-widening area of the markets leading to political extension,² have cultivated the field where the true explanation of industrial evolution shall be found. But there are certain considerations in European history which have obliterated or confused the pure economic facts. Industrial evolution, considered as a mere economic process, had to work its way up through superimposed racial, military, tribal, feudal, ecclesiastical, and gild regulations and restrictions. These have been especially disturbing to Schmoller, but have been delightfully brushed aside by Bücher.³ At the same time, in both cases they have operated to cover up certain significant stages and factors. For example, the retail-shop and the wholesale-order stages of the American shoe industry are not as strikingly apparent in the European process, probably because the powerful gild regulations served to maintain a uniform price for custom work, retail work, and wholesale-order work.⁴ But the gilds were unable to cope with the cut prices of wholesale-speculative work. Consequently Schmoller and Bücher pass over with slight emphasis from the primitive gild stage of Boston, 1648, to the merchant-capitalist stage of 1835. But it is not enough to say that the retail-

¹ Schmoller, *Grundriss*, etc., I: 254 ff.

² p. 89 ff., 135 ff.

³ E. g., their controversy over the influence of heredity in *Jahrbuch f. Gesetzgebung*, vol. 17, p. 303, vol. 18, p. 318.

⁴ Cf. Sombart, *Der Moderne Kapitalismus*, I, 95.

merchant and wholesale-order stages were only "transitional," for they bring to light the fundamental economic forces at work. They reveal the segregation of the merchant-function and the joint effort of both employer and journeyman to extend markets. They modify materially Bücher's modified theory of exploitation through intermediary merchants, by concentrating attention on the competitive menace and the function of protection. It is this bald simplicity of American individualism, without much covering of races, armies, guilds, or prelates, that permits us to trace out all of the economic sutures in their evolution from infancy to manhood.

The menace of competition may conveniently be described as internal and external. The former arises within the area of the existing market, the latter proceeds from cheap producers abroad. With the ever-widening area of political control these external menaces become internal, and it is this moving frontier that determines the scope and character of protective organization and protective legislation.

Throughout the course of industrial evolution the part played by the merchant stands out as the determining factor. The key to the situation is at all times the price-bargain. It is the merchant who controls both capital and labor. If the merchant has a market he can secure capital. Even the modern "manufacturer" is first of all the merchant. The "conflict of capital and labor" is a conflict of market and labor, of merchant and wage-earner, of prices and wages. With the extension of the market the merchant-function is the first to separate, unless prevented by guild or other regulations, and with each further extension the separation is greater. Just as the first "masters'

society" of 1789 was really a retail merchants' association, so the modern "manufacturers' association" is a price-regarding association. Capital follows the merchant, and the manufacturers' protective organization is an organization to protect prices. When the extension of the market provokes the conflict of prices and wages, the wage-earners resort to independent protective policies. Then the manufacturer turns, for the time, from the market and faces the workman. His "employers' association" is wholly different in method, object, and social significance, and usually in *personnel* from his "manufacturers' association."¹

The conflict is ultimately one between the interests of the consumer and the interests of the producer. Wherever the consumer as such is in control, he favors the marginal producer, for through him he wields the club that threatens the other producers. Consequently the producers resort either to private organizations equipped with coercive weapons to suppress their menacing competitor, or else they seek to persuade or compel the government to suppress him. In this way the contest of classes or interests enters the field of politics, and the laws of the land, and even the very framework of government, are the outcome of a struggle both to extend markets and to ward off their menace.

In the early stages the agricultural, as distinguished from the "industrial" interests, are in control, and they stand to the shoemakers as consumers. Consequently, if the industrial interests secure protection,

¹ The merchant and employer functions appear throughout different industrial stages and industries under different names, as follows:

Merchant	{	Master workman	Employer	{	Master workman
		Retail master			Contractor
		Wholesale manufacturer			Manufacturer
		Merchant capitalist			
		Manufacturer			

they must do it by carving out a jurisdiction of their own, enfranchised with political immunities and self-governing organizations. In this struggle did the gilds of Europe rid themselves of feudal agriculture. But in colonial America only the soft petition of the Boston shoemakers and coopers in 1648 shows the high-water mark of the gild. Here protection was grudgingly granted against the internal menace of bad ware and itinerant cobblers. In later times, a manufacturing colony, like Pennsylvania, enacted protective tariffs against external menace, and in 1787 the commercial and manufacturing interests, now reaching out for wholesale trade, secured in the Federal Constitution the political instrument of their mercantile aspirations. Forthwith, as we have seen, the shoemakers of Philadelphia experienced the stimulus of this extension of markets and entered the wholesale-order stage of their industry. At once what had been an external menace now became internal on this wider and lower level of competition, resulting in the separation and struggle of classes. The wage-class began its long contest for the political immunity of a private organization to suppress the "scab" in his many forms of non-unionist, sweat-shop worker, green hand, Chinaman, and immigrant. But, prior to the merchant-capitalist stage, this separation of labor from merchant was sporadic and reconcilable. The employer, as such, with his specialized wage-bargain, had only occasionally appeared. Merchant and journeyman were at one in their effort to protect the price-bargain. Together they joined in their century-long effort, ever more and more successful, to use the federal constitution for the suppression of the cheap ware of the foreign producer. But after the merchant-capitalist period, the slogan of the protective tariff became protection

for labor, where formerly it had been protection for capital. Eventually, with the further separation of labor under its own leaders, protection took the additional form of suppressing the Chinaman and the alien contract-laborer. Turning to the state governments, labor has summoned its political strength for the suppression of the internal menace of long hours, prison labor, child and woman labor. And finally, where neither politics nor organizations suffice to limit the menace of competition, both "manufacturers" and workmen in the shoe trade strive to raise themselves above its level by cultivating the good will of the consumers, the former by his trade mark, the latter by the union label.

Thus have American shoemakers epitomized American industrial history. Common to all industries is the historical extension of markets. Variations of form, factors, and rates of progress change the picture but not the vital force. The shoemakers have pioneered and left legible records. Their career is "interpretative," if not typical.

JOHN R. COMMONS.

UNIVERSITY OF WISCONSIN.

APPENDIX I

"COMPANY OF SHOOMAKERS," BOSTON, 1648¹

Vppon the petition of the shoomakers of Boston, & in consideration of the complaynts which haue bin made of the damag which the country sustaynes by occasion of bad ware made by some of that trade, for redresse hereof, its ordred, & the Court doth hereby graunt libtie & powre vnto Richard Webb, James Euerill, Robt Turner, Edmund Jackson, & the rest of the shoomakers inhabiting & howskeepers in Boston, or the greatest number of them, vppō due notice giuen to the rest, to assemble & meete together in Boston, at such time & times as they shall appoynt, who beinge so assembled, they, or the greater number of them, shall haue powre to chuse a master, & two wardens, with fowre or six associates, a clarke, a sealer, a searcher, & a beadle, with such other officers as they shall find nessessarie; & these officers & ministers, as afforesd, every yeare or oftener, in case of death or departure out of this jurisdiction, or remoueall for default, &c, which officers & ministers shall each of them take an oath sutable to their places before the Gounor or some of the magists, the same beinge pscribed or allowed by this Court; & the sd shoomakers beinge so assembled as before, or at any other meetinge or assembly to be appoynted from time to time by the master & wardens, or master or wardens with two of the associates, shall haue power to make orders for the well gouerninge of their company, in the mannaginge of their trade & all the affayres therevnto belonging, & to change & reforme the same as occasion shall require & to añex reasonable pennalties for the breach of the same; provided, that none of their sd orders, nor any alteration therein, shalbe of force before they shalbe pvsed & allowed of by the Court of that county, or by the Court of Assistants. And for the better executing such orders, the sd master & wardens, or any two of them with 4 or 6 associates, or any three of them, shall haue power to heare & determine all offences agaynst any of their sd orders, & may inflict the pennalties pscribed as aforesd, & asseesse fines to the vallew of forty shillings or vnder for one offence, & the clarke shall giue warrent in writinge to the beadle to leuie the same, who shall haue power therevppon to leuie the same by distresse, as is vsed in other cases; & all the sd fines & forfeitures shalbe imployd to the benefit of the sd company of shoomakers in generall, & to no other vse. And vppon the complaynt of the sd

¹ The Records of the Colony of the Massachusetts Bay in New England, vol. 3, p. 132.

master & wardens, or their attorny or advocate, in the County Court, of any pson or psons who shall vse the art or trade of a shoemaker, or any pt thereof, not beinge approued of by the officers of ye sd shomakers to be a sufficient workman, the sd Court shall haue power to send for such psons, & suppress them; provided also, that the prioritie of their graunt shall not giue them precedency of other companies that may be graunted; but that poynt to be determined by this Court when there shalbe occasiō thereof; provided also, that no vnlawfull combination be made at any time by the sd company of shoemakers for inhancing the prices of shooes, bootes, or wages, whereby either or owne people may suffer; provided also, that in cases of difficultie, the sd officers & associats doe not pceede to determine the cause but by the advice of the judges of that county; provided, that no shoemaker shall refuse to make shooes for any inhabitant, at reasonable rates, of their owne leather, for the vse of themselues & families, only if they be required therevnto; provided, lastly, that if any pson shall find himselfe greiued by such excessiue fines or other illegall pceedinges of the sd officers, he may complayne thereof at the next Court of that county, who may heare & determine the cause. This commission to continue & be of force for three yeares, & no longer, vnles the Court shall see cause to continue the same.

The same comission, verbatim, with the same libtie & power for the same ends, vpon the like grounds is giuen vnto Thomas Venner, John Millum, Samuel Bidfeild, James Mattocks, Wm. Cutter, Bartholomew Barlow, & the rest of the coops of Boston & Charlestowne, for the pventing abuses in their trade. To continue only for three yars, as the former, mutatis mutandis.

APPENDIX II. SHOEMAKERS. — INDUSTRIAL STAGES, CLASSES, AND ORGANIZATIONS

1	2	3	4	5	6	7	8
EXTENT OF MARKET	KIND OF BUSINESS	CAPITAL OWNERSHIP	INDUSTRIAL CLASSES	KIND OF WORK	COMPETITIVE MESSAGE	PROTECTIVE ORGANIZATIONS	CASE
1 Itinerant	Wages	CUSTOMER, MERCHANT, EMPLOYER, LABORER <i>Customer-Employer</i> Material Household Board and Lodging	Farm family Skilled helper	Skilled supervision	Family workers	None	Itinerant individuals 1648
2 Personal	Custom order	<i>Merchant-Master-Journeyman</i> Material Hand tools Home shop	Merchant-Master-Journeyman	"Bespoke"	"Bad Ware"	Craft gild	Boston "Company of Shoemakers" 1648
3 Local	Retail	<i>Merchant-Master</i> Material Finished stock Short credits Sales shop	Merchant-Master-Journeyman	"Shop"	"Market" work "Advertisers" Auctions	Retail Merchants' Association	Philadelphia "Society of the Master Cordwainers" 1786
4 Waterways	Wholesale order	<i>Merchant-Master</i> Material Finished stock Long credits Store-room	Merchant-Master Journeyman	"Order"	"Scabs" Interstate producers	Journeyman's Society Masters' Society	Philadelphia "Federal Society of Journeymen Cordwainers" 1786-1806
5 Highways	Wholesale speculative	<i>Contractor</i> Material stock Bank credits Warehouse "Manufactory"	Merchant-Capitalist Contractor Journeyman	Team work	Prison Sweatshop "Foreigner" "Feeding up"	Journeyman's Society Manufacturers' Association ¹ Employers' Association	Philadelphia United Beneficent Society of Journeymen Cordwainers 1835
6 Rail	Wholesale speculative	<i>Contract Manufacturer</i> Material Finished stock Bank credits Warehouse "Manufactory"	Merchant-Capitalist Contractor Journeyman	Team work	Green hands Chinese Women Children Prisoners Foreigners	Trade Union Employers' Association Women Manufacturers' Association ¹	"Knights of St. Crispin" 1868-1872
7 World	Factory order	<i>Manufacturer</i> Material Stock Credits Tools machinery Factory	Manufacturer Wage-earners	Piece work	Child labor Long hours Immigrants Foreign products	Industrial Union Employers' Association ¹ Manufacturers' Association ¹	"Boot and Shoe Workers' Union." 1895

¹ The "Manufacturers' Association" is the association based on the merchant or price-fixing function.

THE INSURANCE OF BANK DEPOSITS IN THE WEST

I. OKLAHOMA

SUMMARY

The movement, a result of the panic of 1907, 86. — Provisions of the Oklahoma law, 88. — National banks unable to participate in the guaranty, many become state banks, 90. — Rapid increase in the deposits of state banks, 94. — The guaranty of deposits generally favored by the people outside the larger cities, 103. — Political aspects of the question, 103. — More strict banking laws have in every instance accompanied the adoption of the guaranty or insurance of deposits, 106.

WITHIN the last two years, laws providing for the guaranty or insurance of bank deposits, through funds administered by the state, have been enacted in Texas, Oklahoma, Kansas, Nebraska, and South Dakota, a great region stretching from the Gulf of Mexico almost to the Canada line.

The first of these laws was adopted in Oklahoma, and there could be no better place for the experiment than this splendid commonwealth. Tho not a pioneer country, since much of it was opened to settlement twenty years ago, yet its seventy thousand square miles are still in the early stages of their development. Almost every variety of extractive industry and agriculture is here represented, — coal mining, oil production, the raising of wheat, alfalfa, corn, and cotton, and the breeding and fattening of cattle. The population of the new state, much more than one million in number, is intensely American. Its people are ready, when they find no precedent, to make one, as witness their remarkable State Constitution.

The progress to the present time of their experiment of guaranteeing deposits, begun more than a year ago, is here presented. The information is derived from personal observations, official sources, and conversation and correspondence with many Oklahoma bankers. One event of absorbing interest, the closing of the largest state bank in Oklahoma, has just occurred. Authoritative information about the bank and the administration of the state guaranty fund since its closing cannot now be had,¹ and the significance of this episode must be presented in a later paper, together with a study of the legislation adopted in the rest of this region and, proposed, in other states. In the light of these experiments, the subject can then be generally considered and a conclusion reached as to how far insurance of bank deposits is practicable and desirable.

When the bankers of Oklahoma reached their offices Monday morning, October 28, 1907, they found that over Sunday the banks of St. Louis and Kansas City, following the example of New York and Chicago, had suspended cash payments, except in small amounts; and that the Governor of Oklahoma, to give the banks time to meet the situation, had declared a legal holiday of a week. The panic was on. The principal correspondents of the banks were in St. Louis and Kansas City. Currency could not be obtained from either city except in dribblets. An order for \$5000 in currency might bring \$500.00, if so much. The Oklahoma banks had no place to get currency to pay depositors in the panic evidently sweeping over the country.

The paralysis of trade the country over exceeded anything that had been seen in a generation, and the

¹ Oct. 13, 1909.

course of events was the same in Oklahoma as in the other states. Farmers would not sell hogs and grain and cotton because the buyers could not pay in actual money. The movement of commodities stopped, long trains of idle freight cars filled the city yards and cumbered the country sidings. The railroads bought little coal and the output of the mines fell off. Many railroad men, miners, mechanics, and laborers were idle and money to pay others could be scraped together only by the severest of expedients, and at great expense. Values melted away, and business was dead.

All this was the common experience of the United States, and there were two legislative results. It seemed to many that additional supplies of currency in October and November would have saved the situation, and the Aldrich-Vreeland Act was passed in the belief that it would provide such supplies in future stringencies. It seemed to others that there would have been little trouble if bank depositors had known that their deposits were secure; and this theory led to the creation of the Oklahoma deposit-guaranty fund.

Immediately after the declaration of the week-long holiday, the Executive Committee of the Oklahoma Bankers' Association was convened at Guthrie, the capital. A day and night of conferences with the political authorities came to nothing. In a few days, however, the Committee was again at Guthrie to devise some plan to enable the Oklahoma banks to resume cash transactions. It was obviously impossible to pay all the depositors at once, and there was great fear that depositors would stampede if restrictions on cash payments were removed. All over the

country, during November and December, bankers were saying that if the depositors only knew that the banks were sound and their deposits well invested and secure, the usual course of business could be resumed any day. To give depositors this assurance, it was suggested at this second Guthrie committee meeting that the state and nation guarantee the bank deposits. It was agreed that the state bankers present should submit the idea to state banks throughout Oklahoma, while national bankers urged Congressional action. It was soon learned that nothing was to be hoped from Congress, at least in time to be of help in the crisis of 1907. The national banks, through an able Committee, then investigated the feasibility of an organization among themselves to guarantee the deposits in the national banks of Oklahoma, but decided that the scheme was not practicable at the time. The national banks of Kansas are now trying to put such a scheme into operation, as will appear later on in this paper.

A few weeks after the panic began, Oklahoma became a state, and the first state legislature met. The State Banking Board prepared and had introduced a bill to guarantee bank deposits. Governor Haskell was a member of the board.

The bill became a law December 17, 1907, while currency was still at a premium in New York, and before cash payments had been fully resumed by Western banks. The act levied an assessment on each bank of one per cent. of its average deposits to create a fund out of which should be paid deposits of banks that might fail, and provided that in case the fund should be depleted, a special assessment should be made to cover the deficiency. No limit was set

STATE	PARTICIPATION BY BANKS	FIRST ASSESSMENT	SUBSEQUENT ASSESSMENTS PER ANNUM
OKLAHOMA <i>(First Plan)</i> Acts of Dec. 17, 1907, and May 26, 1908. Plan in effect Feb. 14, 1908.	Compulsory. A special examination of all banks was made before law went into effect.	1% of deposits, except State and U. S. deposits otherwise secured.	Sufficient to maintain fund at 1% of deposits
<i>(Modified Plan)</i> Effective June 11, 1909.	Compulsory.	1% of deposits.	1/4 of 1% of deposits until a fund equal to 5% of deposits is accumulated. Thereafter sufficient to maintain fund at 5%, but assessments not to exceed 2% of deposits in any year.
KANSAS Act of March 6, 1909, plan in effect July 1, 1909.	Voluntary, and limited to incorporated banks with unimpaired surplus equal to 10% of capital and in business at least one year. In a town where all existing banks fail to participate for six months after July, 1909, a new bank may participate at once. No bank paying more than 3% interest or any interest on savings deposits withdrawn before Jan. 1, or July 1, may participate. National and private banks and trust companies may reorganize as state banks and participate at once. Each bank must be examined before it may participate.	1/20 of 1% of deposits eligible to guaranty, less capital and surplus. \$500 in bonds or cash for every \$100,000 of deposits must be deposited to guarantee payment of assessments.	1/20 of 1% until guaranty fund reaches \$500,000. If depleted, fund to be restored by additional assessments of 1/20 of 1%, but not more than five such in one year.
NEBRASKA Act of March 25, 1909. Plan in effect July 2, 1909.	Compulsory.	1%, distributed over two years, of deposits, except public deposits otherwise secured.	1/10 of 1%. Special assessments may be made not exceeding 1% in one year.
SOUTH DAKOTA Act of March 9, 1909.	Voluntary. 100 or more banks with not less than \$1,000,000 aggregate capital may join to create the State Association of Incorporated Banks.	1/10 of 1% of average deposits for preceding three months, except public deposits otherwise secured, plus a membership fee of \$100 to \$170 according to capital.	1/10 of 1% of deposits. Special assessments not exceeding 4/10 of 1% in one year may be made to pay then existing deficiencies. Annual rate may be reduced by Board of Commissioners, and again raised.
TEXAS Act effective Aug. 9, 1909. Guaranty fund goes into operation Jan. 1, 1910.	All incorporated banks operating under the general banking law must secure depositors either (a) by the guaranty fund, or (b) by furnishing a "guaranty bond." If bank is incorporated, such bond must equal its capital; if private, one-half its average deposits. Bond may be executed by three approved personal or one approved corporate surety.	1% of deposits, except public deposits otherwise secured.	1/4% of deposits until fund equals \$2,000,000. In case of depletion of fund, or of emergency, payment not exceeding 2% of deposits in one year may be required.

THE CHIEF PROVISIONS OF RECENT LEGISLATION UPON BANK D

SEQUENT ASSES- MENTS PER ANNUM	ASSESSMENTS UPON NEW BANKS	TRUST COMPANIES	NATIONAL BANKS	WITHDRAWAL FROM PARTICIPATION	WHAT DEPOSIT INSURANCE
to maintain fund at deposits	3% of capital, subject to adjustment on basis of deposits.	Participate.	May participate.	Cannot withdraw.	All.
1% of deposits until a equal to 5% of deposits accumulated. Thereafter ent to maintain fund at but assessments not to 1 2% of deposits in any	3% of capital subject to adjustment on basis of deposits.	Participate.	No provision	Cannot withdraw.	All.
1% until guaranty fund is \$500,000. If de- fund to be restored by annual assessments of 1/20 but not more than five in one year.	Amount approximately equal in each case to its share of guaranty fund after deduction of losses.	To participate must reorganise as state banks.	May participate.	May withdraw on six months' notice, but must pay all assess- ments on account of banks that fail before expiration of this no- tice. Bank Commis- sioner may for cause, cancel the guaranty of any bank's deposits.	Deposits not interest; cer- payable no than six from date, not more th interest; sav- posits not ing \$100, o not more th Deposits of secured are sured.
1%. Special assess- may be made not ex- 1% in one year.	At least 1% of deposits as shown by first two statements. Must pay in, on organization, 4% of capital as a credit fund toward payment of assessments.	All corporations doing a banking busi- ness participate.	No provision.	Cannot withdraw.	All.
% of deposits. Special ments not exceeding 1% in one year may be to pay then existing de- bits. Annual rate may used by Board of Com- missioners, and again raised.	Same as upon old banks. Apparently banks must be three months old to become members. (Sec. 6 of Act.)	Corporations doing a banking business participate.	May participate.	No provision on the sub- ject.	All.
deposits until fund \$2,000,000. In case of on of fund, or of emer- payment not exceeding deposits in one year required.	3% of capital and surplus subject to adjustment on basis of deposits.	Participate if sub- ject to the general banking law. Com- panies operating under special char- ters may volun- tarily submit to the general law.	May participate.	Pro rata part of fund un- used to be returned to banks voluntarily liqui- dating.	Non-interest b except publi posits, if wise secured

BANK DEPOSIT INSURANCE

WHAT DEPOSITS INSURED	WHEN DEPOSITS PAID	LIMITATION OF DEPOSITS
ALL.	In full immediately after bank is closed.	No limit.
ALL.	In full immediately after bank is closed. If fund is insufficient at the time, depositors shall be given 6% Certificates of Indebtedness, which shall be paid in the order of their issue.	To ten times capital and surplus, not applying, however to deposits of other banks.
Deposits not bearing interest; certificates payable not less than six months from date, bearing not more than 3% interest; savings deposits not exceeding \$100, drawing not more than 3%. Deposits otherwise secured are not insured.	On closing a bank, depositors shall be given 6% certificates, to be paid by dividends from assets, including the double liability of stockholders. After realization on such assets, the balance due on the certificates shall be paid out of guaranty fund. If fund is insufficient, depositors shall be paid <i>pro rata</i> , the remainder due to be paid when next assessment is available.	To ten times capital and surplus.
ALL.	In full as soon as deficiency in the cash in hands of the bank's receiver is determined. No provision in case fund shall remain insufficient after levy of special assessments.	<i>Investments</i> must not exceed eight times capital and surplus.
ALL.	In full on certificate of bank's receiver that assets are insufficient to pay depositors. If fund is insufficient "all, or so much as may be necessary, of what is accumulated in said (bank deposit insurance) fund within the year covered by the last payment of premium by the insolvent, shall be distributed pro rata among said depositors until such depositors shall have been paid in full." Apparently, if accumulations within the year are not sufficient, the depositors are not to be paid in full.	Under another law deposits are limited to fifteen times capital and surplus.
Non-interest bearing except public deposits, if otherwise secured.	At once, on closing of bank.	Must increase capital by 25% if average deposits exceed certain ratios to capital and surplus ranging from five times a capital and surplus of \$10,000 to ten times a capital and surplus of \$100,000 or more.

LIMITATION OF INTEREST PAYMENTS BY PARTICIPATING BANKS	HOW FUND KEPT	PERMISSIBLE ADVERTISING
<p>Bank Commissioner may fix maximum. (Fixed at 3% on bank balances, and certificates of deposit for less than six months. 4% on savings deposits and certificates for six months or longer.)</p> <p>Same as under first plan. (Rate fixed, same as above, except that certificates drawing 3 3% must be issued for not less than 90 days.)</p>	<p>No provisions.</p> <p>75% in State warrants or in other securities that are lawful investments for state funds.</p>	<p>"Deposits are protected by the Depositors' Guaranty Fund of the State of Oklahoma."</p> <p>Same as under first plan. Penalty provided for advertising that deposits are guaranteed by State of Oklahoma.</p>
<p>To 3%.</p>	<p>Deposited in banks on collateral (state or municipal bonds).</p>	<p>"Deposits are guaranteed by Bank Depositors' Guaranty Fund of the State of Kansas." Penalty provided for so advertising as to tend to convey the impression that deposits are guaranteed by the State of Kansas.</p>
<p>None.</p>	<p>The assessments levied upon each bank are to be held by that bank payable to the State Banking Board on demand.</p>	<p>"To effect that Depositors are protected by the Depositors' Guaranty Fund of the State of Nebraska."</p>
<p>5%.</p>	<p>By State Treasurer. In case the law shall provide for stated depositaries, shall deposit fund therein, provided that fund may be invested in state warrants.</p>	<p>Banks receive certificate of membership in Association. No provision on subject of advertising.</p>
<p>No limitation, but interest bearing deposits are not protected by guaranty fund.</p>	<p>One-fourth deposited with State Treasurer. Three-fourths credited to State Banking Board on books of respective banks.</p>	<p>"The non-interest bearing and unsecured deposits of this bank are protected by the Depositors' Guaranty Fund of the State of Texas."</p> <p>or</p> <p>"The deposits of this bank are protected by guaranty bond under the laws of this state."</p> <p>Penalty provided for statement that State of Texas guarantees deposits.</p>

to such special assessments, and each state bank was therefore the absolute guarantor of the deposits of all the other state banks of Oklahoma. New banks were required to pay as organized, 3% of their capital, this payment being subject to adjustment on the basis of deposits at the end of their first year.

All state banks were by this law compelled, and national banks were permitted, to guarantee their deposits in this way. As will be seen later, the Comptroller of the Currency refused to allow national banks to participate in the scheme.

The chief provisions of the Oklahoma statute are shown in the accompanying table, in comparison with the provisions of the deposit-guaranty laws of other states.

Now the territory of Oklahoma had for a number of years enjoyed a good banking law and a competent Bank Commissioner. Failures had been few. The financial history of Oklahoma is brighter than the early financial history of other states in the same region. With the admission of Oklahoma as a state, however, there were added to the institutions under the supervision of the Bank Commissioner, some 175 banks and trust companies from the old Indian Territory. These had been operating without any public supervision or examination. They were officially an unknown factor in the banking situation. Partly because of these banks, and partly to make it as sure as possible that only good institutions should have their deposits guaranteed, the Bank Commissioner decided to have every institution in his charge examined within the sixty days before the law would go into effect. Four hundred and sixty-eight banks had reported to the Commissioner December 11,

1907. The examination of so many banks in a single state within two months is unique. It was accomplished by employing active bank officers as special examiners of other banks than their own. The fact is remarkable that almost all the banks stood the test. A few were required to liquidate, and, many being found, as the Commissioner says, "not in harmony with the law at all points," were given further time to comply fully with the law; but, practically speaking, the banks of Oklahoma went into the guaranty system, February 14, 1908, with a clean bill of health.

Expecting the insurance or guaranty of deposits under state supervision to be attractive to depositors, no fewer than fifty-seven national banks applied to have their deposits guaranteed, and were examined by the Bank Commissioner of Oklahoma as provided by the guaranty law. On July 28, 1908, however, the Attorney General of the United States, Mr. Bonaparte, advised the Comptroller of the Currency that a national bank could not legally participate in the Oklahoma guaranty. In Mr. Bonaparte's opinion it was beyond the powers of a national bank to insure its deposits against loss, and he believed that under the Oklahoma law the banks were not effecting insurance but giving contracts of guaranty, or suretyship, which national banks clearly could not do. The Comptroller of the Currency, therefore, forbade the national banks to participate in the guaranty scheme.

Litigation to resolve the legal questions was already under way. Many bankers felt that it was unwise and unfair to require the successful banks to pay the debts of the unsuccessful. As a test case, the Noble State Bank asked for an injunction restraining the State Banking Board from enforcing the law in its case. The points were made that the bank's charter

rights were not subject to change by the legislature and that to exact contributions to a fund for the payment of deposits of failed banks would be to deprive it of its property without due process of law. The Supreme Court of Oklahoma ruled, however, that the charter was granted under conditions that made the bank's rights thereunder subject to legislative amendment. Banking, it further held, was a quasi public business. The assessments complained of were for the purpose of safeguarding the public in its dealings with the banks, and it was within the police power of the state to levy them, there being moreover a consideration in the benefits derived by all banks from the assurance thus afforded customers of the safety of their deposits.¹

The case was appealed to the Supreme Court of the United States, and has not yet been decided.

The situation by midsummer of 1908 was that national banks had been forbidden to obtain guaranty of their deposits, the constitutionality of the law as to state banks had been seriously attacked, and the state banks were advertising far and near and forcibly, the protection afforded to their customers by the "Depositors Guaranty Fund of the State of Oklahoma." Some banks went so far as to advertise that their deposits were guaranteed by the state itself. This was not permissible under the law, and was forbidden under penalty by the amendatory act effective June 11, 1909; but some banks continued so to advertise as, perhaps, to give the impression that the state as such protected the depositors. "Deposits protected by the law of Oklahoma," or similar phrases, have been used. In country banks much of the appeal for business is by word of mouth, and state bankers

¹ The opinion in this case may be found in 97 Pacific Reporter, 590.

CERTAIN ITEMS IN OKLAHOMA BANK STATEMENTS

STATE BANKS	Feb. 29, '08	May 14, '08	July 15, '08	Sept. 23, '08	Nov. 27, '08	Feb. 5, '09	April 28, '09	June 23, '09
Number of banks	470	494	499	520	546	574	611	631
Capital	6,233,216	6,640,650	6,795,050	7,456,250	7,957,350	8,487,525	9,587,950	10,270,800
Surplus	580,892	563,417	585,951	595,774	613,218	742,366	752,892	758,774
Due to Banks	476,527	705,727	711,677	1,341,324	1,823,620	2,573,102	3,691,633	3,896,541
Individual Deposits	18,032,284	20,387,887	21,216,526	24,971,147	29,448,970	35,160,713	40,991,937	42,722,927
Due from banks	7,529,816	7,919,878	7,206,695	8,593,570	11,186,403	14,366,615	15,600,732	14,390,114
Cash in bank	2,078,687	1,964,392	1,968,944	2,295,700	2,892,485	2,973,453	3,707,240	3,643,366
NATIONAL BANKS	Feb. 14, '08	May 14, '08	July 15, '08	Sept. 23, '08	Nov. 27, '08	Feb. 5, '09	April 28, '09	June 23, '09
Number of Banks	312	309	308	298	288	270	242	230
Capital	12,215,350	12,212,700	12,242,500	11,890,000	11,447,500	10,987,500	10,140,000	9,730,000
Surplus	3,063,039	3,065,444	3,118,143	3,102,543	3,019,723	3,091,922	2,849,009	2,775,489
Due to banks	4,416,212	4,599,145	3,988,660	4,070,891	5,498,125	6,253,297	5,405,316	5,123,122
Individual Deposits	38,298,247	38,342,552	36,820,989	36,142,095	36,280,346	39,716,166	38,994,192	38,111,948
U. S. Deposits	1,789,280	1,718,337	1,697,409	1,751,175	1,714,831	1,620,135	1,210,425	1,203,412
Due from banks	14,801,868	13,962,536	11,398,843	10,844,305	11,932,340	15,523,947	14,426,383	12,901,584
Cash in Bank	5,878,268	5,118,691	4,473,543	4,426,087	4,573,081	4,246,749	4,362,243	4,373,131

have not failed to point out that deposits in their banks are guaranteed.

The state banks were gaining on the nationals, as is shown by the accompanying tables compiled from official returns.

Between the February and May statements of 1908, the number of state banks had increased 24. The number of banks in Oklahoma territory had increased only one between June 1, 1907 and December 11, 1907, and the number in Oklahoma state had increased only two between December 11, 1907 and February 29, 1908. The frequent organization of banks after the latter date was because it was supposed that a new bank could obtain a good line of deposits more rapidly under the assurance of safety given to depositors by the new law. Fewer banks were organized during the early summer, but the July statement showed a gain in the individual deposits of state banks since the taking effect of the guaranty law of more than \$3,000,000.00. The national banks had decreased four in number, and their deposits had declined about two-thirds of the amount the state banks had gained. Both classes of banks had exhibited in the February statements abnormally large reserves, because of the accumulation of cash and sight exchange during the panic. These reserves had declined somewhat by midsummer, but remained ample in both cases. The following table shows the percentage of the cash resources of Oklahoma banks to deposits, (a) when the guaranty law went into effect, (b) one year later, and (c) on June 23rd, 1909. In working out these percentages, some small miscellaneous items of deposit and of exchange are, for the sake of perfect accuracy, added to the items shown on this table. The technical legal reserve of national banks is so

calculated as to be incomparable with the reserve of state banks, but the following percentages have been calculated on the same basis for both classes of banks:

STATE BANKS		Feb. 29, 1908.	Feb. 5, 1909.	June 23, 1909.
Percentage of cash and sight exchange to deposits		51.8	45.9	38.9
Percentage of cash to deposits,		11	7.8	7.7
NATIONAL BANKS		Feb. 14, 1908.	Feb. 5, 1909.	June 23, 1909.
Percentage of cash and sight exchange to deposits,		46.8	41.9	39.2
Percentage of cash to deposits,		13.2	8.9	9.8

After the July statement, the organization of state banks proceeded rapidly. By June 23d of this year, the number had further increased 132, and had reached 631. Many of the new state banks were conversions of national banks, the number of the latter falling 78 in the same time, a total loss of 82 since the taking effect of the guaranty law. Only four national banks, all with the minimum capital of \$25,000 each, were chartered in Oklahoma from February 14, 1908 to September 7, 1909, while twenty had been chartered in the year ending October 31, 1907.

The April statements of 1909 showed that the state banks had overtaken the national banks in individual deposits, and in the June statements the total deposits of the state banks, including the deposits of other banks, were greater than all the deposits in the national banks. In the state banks, individual deposits alone had grown under guaranty from \$18,000,000 to nearly \$43,000,000; more than double. Of this gain of \$25,000,000, about \$7,300,000 came from the conversion of seventy-three national banks. In the national banks, individual deposits had barely held steady. The item "deposits of other banks" showed a gain. Of course the deposits of the national

banks averaged larger per bank than before, because there were fewer banks. Capital had measurably kept pace with deposits, and this item, too, had become larger in the statements of state banks than in those of the nationals. The surplus of state banks could not, of course, increase in proportion to the increase in capital; the latter being swelled by the organization of new banks, which would require time to accumulate surpluses.

Without question, the growth of \$25,000,000 in the deposits of the state banks of Oklahoma since the establishment of a system of deposit guaranty, had been due to that guaranty. There have been many attempts to explain the growth of deposits in other ways, but it cannot be done. It was suggested that the State School Fund of \$5,000,000 would account for part of the early growth, but as early as March, 1, 1909 the unexpended portion of the fund amounted to only \$1,187,950, of which \$250,000 was in national banks.¹ There has been a tendency to place other public moneys, state, county, city and school district accounts in the state banks. Such accounts are not separated from individual deposits on the statements published by the Bank Commissioner; but all the idle public funds of the new state cannot amount to \$25,000,000 or any large fraction of it. The state itself is issuing warrants for expenses, as are some of its municipal divisions.

The rapid growth of Oklahoma accounts for part of the gain, but only the state banks, as a whole have gained.

It is true that large sums have been received on deposit from citizens of other states, and that \$7,000,000 came with converted national banks, but the out-

¹ Letter from Bank Commissioner Young to the writer.

side deposits and the wholesale conversions of national banks only demonstrate the strong appeal that deposit insurance makes to actual and potential depositors. A good deal of buried money has been dug up and placed in banks.

Some have asserted that deposits have been attracted by the payment of excessive interest, but the state banks are probably paying lower rates than are the nationals. The Commissioner informed the writer last March that of all the national banks converted up to that time, about forty, all but two were paying from 5% to 7% on time deposits. State banks are limited to 4% by the Commissioner, who has power to fix the maximum. Some state banks would like to pay more to meet the competition of national banks, and in parts of Oklahoma 5% is not too much to pay in view of economic conditions; but the Commissioner adheres to his position.

Some state banks paid higher rates at first; one paid 8% for a short time until the Bank Commissioner heard of it. It is said that some bankers are evading the Commissioner's ruling by paying excessive interest out of their own pockets, but the Commissioner says that he cannot discover that this is done in many cases.¹ The practice cannot obtain to any important extent.

The following statistics of bank organizations and conversions under the guaranty law will be more readily appreciated if it is recalled that Oklahoma is a typical part of the great central region of this country in which banks of the smallest legal capitalization abound. On account of the lack of a system of branches, banking facilities are afforded by banks

¹ Reply by Bank Commissioner A. M. Young to Professor W. C. Webster, *Journal of Pol. Econ.* July, 1909. p. 463.

of \$10,000 capital; such banks being often established in towns of fewer than 100 people. Formerly the new banks frequently had only \$5000 capital, but with the growth of wealth the states in this region have generally fixed \$10,000 as the minimum capital, and most of the new banks have naturally not exceeded the minimum. Capital is scarce on the economic frontier.¹

The following information has been derived from the Annual Report of the Bank Commissioner, November 1, 1908, and from a list kindly furnished by him, of banks organized since; and by comparing both with the Reports of the Comptroller of the Currency for 1907 and 1908. From February 14, 1908 to September 1, 1908, 179 state banks were chartered, including 77 conversions of national banks. Between November 16, 1907 and November 1, 1908, nineteen state banks liquidated, three changed location, two consolidated with other banks, and two nationalized. Their capitals are not stated in the Commissioners report for 1908. Few banks have liquidated or nationalized since. The 179 state banks had \$3,684,000.00 capital distributed as follows:

69	had each	\$10,000.00
37	" not over	15,000.00
7	" " "	20,000.00
40	had each	25,000.00
10	" not over	35,000.00
12	" " "	50,000.00
2	" " "	61,000.00
1	"	100,000.00
1	"	200,000.00

The guaranty of deposits did not create the tendency to small capitalization. Indeed there are

¹ For studies, by the writer, of banking in this region, see "The Distribution of Small Banks in the West," Q. J. E. xii, 70; "The Minimum Capital of a National Bank," North American Review, Vol. 167, p. 457. "The Effect of the New Currency Law on Banking in the West," Q. J. E. xv, p. 277. "Branch Banking for the West and South," Q. J. E. xviii, p. 97.

rather more new banks with capital over \$10,000 than might have been expected. For this there are three reasons. Many of the banks are conversions of national banks, all of which before conversion had at least \$25,000.00 capital each. An unusually large number of banks was established in towns that already had banks of more than the minimum capitalization. The acts of May 26, 1908 and June 11, 1909, successively forbade banks of the minimum capitalization, the former in towns of more than 2500 population, the latter in towns of more than 500 population.

The 77 banks converted during the period November 16, 1907 to September 1, 1908, had as national banks \$2,525,000 capital, and as state banks \$2,047,000; the shrinkage illustrating the necessity of economizing capital in undeveloped or partially developed states. Where there is so much need of buildings, plows, horses, wagons, wind-mills, and cattle, comparatively little can be spared for banking. Of the 77 institutions that have left the national system to become state banks,

6 have more capital than before,
33 have the same capital, and
38 have less.

The conversion of these banks has been the most dramatic feature of the guaranty episode. The national bankers valued their charters. Many had strained a point to provide the capital required in the national system in order to share in the prestige that national banks have to this time enjoyed.

Newcomers to the state, however, and newcomers are many, for Oklahoma is growing fast; instead of depositing in national banks, which they would have preferred a short time ago, have sought out the state

banks. In spite of this, few banks converted until their own business, the result sometimes of years of effort, began to slip away. Quite a few national bankers organized state banks to hold the business of those customers who wanted their deposits guaranteed. The national charters, valued from considerations of business and sentiment, were not surrendered, but the national and state banks were operated under the same management, side by side. The State Banking Board is no longer authorizing the organization of state banks in such cases, but cannot refuse the owners of an old charter permission to resume business. The Guthrie National Bank, owning an old territorial charter, reopened the old Bank of Indian Territory August 16, 1909, in the building in which its own offices are. One Oklahoma national banker to whom the writer applied for information in March of this year, answered with a criticism of the origin of the guaranty bill. Answering another letter in May, the same banker wrote,

"To begin with you will note from the above letterhead that we have surrendered our National Charter and taken out a State Charter here. This, of course, is because of the guaranty law. . . .

"I have not changed in my ideas. I believe as firmly as ever that it is wrong, — unsound economically, and that it cannot last. I believe that some day the whole idea will go up in smoke, just as other foolish notions originated for their popularity have gone.

"But, — from a practical standpoint, it is a difficult matter for a bank in a country community, especially where the banker is practically a stranger, to stand out against. There is no question but that the farmers, and many others, — many of whom ought to understand better, do believe in the idea, and they deposit their funds where the guaranty will protect them. We found that in many instances customers who were under obligations to us, men who actually owed us at the time, were carrying small accounts at the state banks, and have had them send us a check on a state bank to pay interest on a note we were carrying,—

asking at the same time for a renewal. I have had customers tell me with an apology that, to satisfy perhaps, their wife, — they have opened a silent account at a state bank, still checking on us because their treatment here had been such that they were ashamed to openly hold the account at another bank.

"These, and other instances, induced me to make a very careful inquiry among all kinds of people, asking them in frankness their ideas, and almost to a man they favor the guaranty.

"Theoretically, it is wrong: Fundamentally, it is wrong: Economically, it is unsound, and, therefore, wrong: — but practically, in a country community, at least, it is popular, and we felt that it was best to convert.

"In this connection, however, let me say that the legislature at its last session amended and modified the law, limiting the amount which may be assessed against a bank in any given year, and thus took away the most dangerous feature of the old law, — the unlimited liability."

There are a number of cases of sales of national banks to men who were entire strangers to the communities in which the banks were located, but who by converting the banks to state banks under the guaranty law, greatly increased their business.

The letter just quoted is typical. When a deposit insurance law was passed in Kansas this year, the National Bank of America of Salina, Kansas, a large and strong bank, wrote each national bank in Oklahoma for its experience in competing with guaranteed banks. The replies were so interesting that the bank published 214, practically all of them, in a pamphlet. A number of the banks had been converted into state banks before answering. One bank wrote:

"For quite a while we asked nearly every farmer that came in what he thought about the guaranty law and almost without exception everyone said he would just a little bit rather have the money in a guaranteed bank than in a National bank and we have had several good sized deposits brought in solely because we were a State bank and they considered their deposits guaranteed.¹

¹ Letters from National Banks in Oklahoma upon the Guarantee Law, p. 36.

Another said:

"The National bank (here) has always been the stronger bank and always had the larger deposit. In fact the 'panic' left the State bank in a very delapidated condition. The state passed the guarantee law and from that time on the State bank has gained rapidly and the National bank stood still.

"We boasted of our strength and standing in the community, but we find that 'strength and personality' cut no ice and the bank with the guarantee will take your business in spite of every effort. We did not like the idea, but when we saw how things were going we surrendered our National charter and became a State bank. We are glad we did it and have checked the business that seemed slowly but surely going to the other bank.

"Our experience teaches us that the guarantee is a deposit getter. It is so especially with new comers. It will not affect your old line customers, but all transient business and all in-coming business will line up with the guarantee.

"The guarantee will cause your time deposit account to increase, and as an advertisement there is no better theme to work on."¹

The following are quotations from letters of national banks that did not liquidate:

"The State bank has gotten some business which none of the banks here had. This is always the case with a new bank."²

"While the State bank has increased its deposits it is from money that has been hidden away and buried that the guaranty has helped to bring from hiding."³

"The fellow who comes from Iowa, Illinois, Nebraska, or Minnesota seems to look at the word 'guaranty' as something to conjure with and I have no doubt but we lose business of that kind."⁴

"Customers of the National banks would open an account with the guaranty bank with the proceeds of the sale of crops, etc., and keep on checking on the Nationals until their balances were so small that they did not amount to much, and the out-come is that the deposits have decreased."⁵

"I for one would make the change at the earliest possible time that I could.

"We have done well and we cannot see that we have lost much business since the opening of the guarantee bank here, but

¹ Letters from National Banks in Oklahoma, p. 37.

² Ibid. 26.

³ Ibid. 8.

⁴ Ibid. 32.

⁵ Ibid. 35.

there is always a dread feeling that you have that you fear that you will lose business by having such a law and you never get over it and sometime that feeling almost runs into a fever from the moves of some of your good customers and you have got to have a look-out all the time and two or three night watchmen on duty every night and they have got to be friends outside and not shareholders and that puts you under everlasting obligations to these outside fellows and therefore, if we could call back one year I would insist on taking out a State guaranteed bank. There is too much work attached to it now, you just simply work day and night to hold your business and while I am up at nights doing something for my trade my competitor is at home sleeping and I don't like that. We have not changed and I don't know that we will, but if I had it to do over I would recommend a change.

"Now, we are in a little town and that makes a big difference because the customers you have are nearly all country people and they like the word guarantee written upon everything, upon their shoes, and upon the meat, and everything else, whether it is worth anything or not they like it and some of them will look up excuses in some other way to quit you and will magnify your faults and everything else will come up that you cannot now think about."¹

"Hoping that the national government would give us some relief, we failed to [convert]."²

"We have no intention of giving up the National here, *although most of the stockholders as well as myself are Democrats*, and this is one of our State's democratic pets."³

"If ever three or four good sized State banks fail, there will be a run on all the others and there won't even be Democratic politicians enough in Oklahoma to collect the guaranty fund."⁴

"About the only class of people that we lost were a few democrats."⁵

"*In communities which are strongly democratic* some National banks have surrendered their charters, have taken out state charters and have pushed the guaranty feature with great energy, appealing to the people upon the ground of supposed added safety, and also appealing to their political loyalty, the guaranty feature here being strongly a democratic creation."⁶

"In small towns, there can be no question that it had affected the business of National banks; but in the larger places it has made no particular difference. Our business has grown very materially since the guaranty law has been in force, and this is largely true of all National banks in the larger places of Oklahoma."⁷

¹ Letters from National Banks in Oklahoma, p. 38.

² Ibid. 38.

³ Ibid. 19.

⁴ Ibid. 5.

⁵ Ibid. 21.

⁶ Ibid. 15.

⁷ Ibid. 2.

*"No, I would stay under the Stars and Stripes with my National bank charter."*¹

In publishing the letters, the National Bank of America of Salina said:

"These replies so strongly substantiate our own preconceived opinion that a strong National will not suffer more than a temporary loss of business that we send them out to encourage others."²

This conclusion is generally correct as to the older banks and larger towns although there are important exceptions. It is suggested by a large number of the letters, and is confirmed by examination of the statements of national banks in such towns, but it is evident that in the smaller towns the depositors now want their deposits guaranteed or insured. This was a plank in the national platform of the Democratic Party in 1908. It is the fashion to say that political feeling has died out in this country, but Oklahoma, settled from older states, is in many ways typical of the Mississippi River states 25 years ago, and party feeling is intense. Some of the extracts just quoted show that many regard guaranty as a democratic rather than as a financial policy. All through the campaign of 1908, in Oklahoma, stump speakers argued the guaranty of bank deposits. Comparisons were drawn, not always by politicians, between the misery that followed specific bank failures in other states, and the orderly payment depositors were promised under the Oklahoma guaranty.

Indeed, there was an Oklahoma instance. The International Bank of Coalgate, one of the banks "not in harmony with every provision of the banking laws" when the guaranty went into effect, and whose condition, although apparently somewhat im-

¹ Letters from National Banks in Oklahoma, 25.

² Ibid. 1.

proved, had not been made satisfactory to the Bank Commissioner, was closed May 21, 1908. Depositors were paid in full by the use of part of the guaranty fund. The bank proved to be solvent, the fund was reimbursed from the assets, and the bank was reorganized under new management. It has been alleged that it was closed to furnish a demonstration for the Democratic National Convention at Denver. Be that as it may, the management had after repeated warning failed to correct objectionable conditions, and the closing was doubtless legally warranted. There has been since the first of this year a magazine at Vinita, Oklahoma, the "Bank Deposit Guarantee Journal," which has made frequent use of this episode. It prints a picture of a farmer and his wife before the bank, on the door of which is the notice of the Bank Commissioner asking depositors to please call for their money. In juxtaposition, is a mob besieging the doors of a closed bank in some other state, or a laboring man heartbroken over the loss of his savings. Such pictures, and the talk they suggest, (accounts in country banks are much influenced by talk), must have been effective.

The case of the Columbia Bank and Trust Company of Oklahoma City, the largest state bank in Oklahoma, which closed September 29, 1909, will be discussed in the next number of this Journal.

The panic was scarcely over when the campaign of 1908 began, and, between politics and finance, the laboring men and farmers and many business men were convinced of the desirability of a fund, administered by the state, to guarantee bank deposits. This is why national banks in the small towns lost business and converted. This is why the state banks gained so largely in number and business. Whether

the gains under the system will be permanent, can best be discussed after considering the course of the deposit insurance movement in other states.

With state banks gaining on the national banks, and passing them in total business, there has developed some ill feeling. The national bankers have resented the implication in much of the talk and advertising that state banks are safer than theirs, and have bitterly criticised the law as worthless and dangerous. Each class of bankers has thought that the other was using improper arguments.

This feeling has partially disrupted the Oklahoma Bankers' Association. This organization has been most useful, not only in looking out for the banks in general ways, but in furnishing burglary insurance, fire insurance, and officers' bonds, through arrangement with various insurance organizations. The state bankers, feeling that after the establishment of the guaranty system their interests were no longer identical with those of the national banks, organized a "State Bankers" Section of the Association, which met last May at Enid, a day before the convention of the Association proper. State banks may belong to the Section without belonging to the parent Association. The Bankers' Associations of the various states arouse in their members the sentiment of patriotism, for the Associations have been built up by hard work, are of great use to the banking interests, and have led to the formation of life-long friendships among those engaged in their official or committee work. Many bankers of Oklahoma naturally regret the appearance of disruptive tendencies in the original Association. The feeling between national and state bankers has been heightened by the course of the Bank Commissioner. This year Mr. A. M. Young succeeded Mr.

H. H. Smock in the office. Mr. Young believes in the state banking system, and its method of deposit insurance. He has not confined himself to the mere supervision of the state banks, but has naturally interested himself to advance the state system by bringing as many banks as possible into it. For this he has been unjustly blamed.

All the states that have adopted deposit guaranty or deposit insurance have made their banking laws more strict. In the guaranty act, Oklahoma required bank directors to own at least \$500 stock, free of pledge. The amount is small, but the requirement is a decided step forward. The same act also prohibited active officers from borrowing from their own banks, and provided for their removal at the instance of the Commissioner for dishonesty, recklessness, or incompetency.

The later act, effective June 11, 1909, permits banks to receive individual deposits to the amount of ten times their capital and surplus, and requires them, when deposits come to exceed that amount to increase capital or surplus, or to cease receiving deposits. The capital required by law in new banks had varied according to population. This act has changed the classification of towns and cities with the effect of considerably increasing the capital requirement.

This act changed the protection of deposits from guaranty to insurance. Not a few state bankers had been restive under the feeling that they were guarantors of all the deposits of all the other state banks. National bankers had argued, that because of this liability, state banks were not so safe as nationals. The new law, therefore, limited to two per cent. of deposits the emergency assessments that might be levied in any one year. The regular assessment is

one per cent. of deposits the first year, and one fourth of one per cent. each year thereafter, until a fund equal to five per cent. of the deposits is accumulated. The emergency assessments are to keep this fund up to five per cent. If fund and assessments are ever insufficient to pay depositors of failed banks, six per cent. certificates of indebtedness are to be issued, and paid in the order of their issue.

At the time of the enactment of the first guaranty law, the Bank Commissioner was Mr. H. H. Smock, an experienced and successful official. Last January he resigned to become Vice-President of the Columbia Bank and Trust Company, of Oklahoma City, an institution to be mentioned later. He was succeeded by Mr. A. M. Young, also an able Commissioner. Under both, the administration of the Banking Department has been vigilant. The right to require the resignation of undesirable bank officers has been used. The selection of reserve agents for state banks has been supervised. National banks that pay higher interest than Oklahoma state banks are allowed to pay are not permitted to act as reserve agents. This ruling is made partly to prevent a form of competition particularly annoying to state banks, which are legally unable to meet it. We shall meet with this situation in Kansas. Both Mr. Smock and Mr. Young have required evidence of experience, character, and ability in the proposed management before authorizing the opening of new banks. Both have refused authority for banks at points that in their opinion already had adequate facilities, following in this the practice of the Comptroller of the Currency. In one case a writ of mandamus was obtained to compel the issuance of a certificate of authority to transact business, but notwithstanding this decision against it, the Com-

missioner's office still declines to authorize banks where in its opinion they are not needed. Very rarely can the organizers of a bank proceed successfully against official disapproval.

The Oklahoma experiment of deposit guaranty has been tried with faithful purpose to make it succeed, and to do away with the paralysis of trade and the human misery that have followed bank failures.

We leave the subject for the present, at a time when the system is undergoing the severest possible test through the closing of the largest bank in the system. Some such early shock was not altogether unexpected from the general conditions. When we resume in the next number the relation of the Oklahoma experiment and compare it with those of other states, the course of events may make clear certain conclusions we should now have to reach by long inferences.

THORNTON COOKE.

KANSAS CITY, Mo.

TECHNICAL DEVELOPMENT IN COTTON MANUFACTURING SINCE 1860¹

SUMMARY

Outline of the manufacturing process, 110. — Improvements in the various departments since 1860, 112. — I. Preliminary processes: opening, picking, carding, and drawing, 112. — Relative importance of contributions by American and by English inventors, 120. — II. Ring spinning and mule spinning compared, 121. — Reasons why former predominates in United States and the latter in Great Britain, 129. — III. Preparation of warp yarn, 133. — Spooling, 133. — Warping, 134. — And Sizing, 136. — IV. Weaving, 140. — Plain looms, 143. Automatic looms, 144. — Comparison with methods of weaving in Europe, 147. — V. Variety of methods and machines for finishing the cloth, 152. — Bleaching, 152. — Printing, 153. — Dyeing, 153. — Mercerizing, 156. — Finishing, 157. — Significance of the improvements in the machinery and processes for manufacturing cotton cloth during the last fifty years, 158.

THE task undertaken in this paper is to show with especial reference to the United States, what changes in cotton manufacturing machinery have taken place since our Civil War. In the last half of the eighteenth century the technique of cotton manufacturing was revolutionized by the great English inventors. But their inventions, remarkable as they were, were only the beginnings of a series of improvements which have continued to the present time. What have the Ameri-

¹ The material for this paper has been obtained through visits to a number of cotton mills, and from interviews and correspondence with cotton manufacturers and machine manufacturers. In addition many works of a more or less technical character have been consulted. For tracing the history of the different machines the Transactions of the New England Cotton Manufacturers' Association, later the National Association of Cotton Manufacturers, have been especially useful. The following are the other more important works of which use has been made.

Cyclopedia of Textile Work, Chicago, 1907. This gives a detailed description of the machinery and methods used in the various branches of the textile industry.

G. O. Draper, Textile Texts. 2nd edition, Hopedale, 1903. This descriptive catalogue, issued by the Draper Company, describes fully the machines which they manufacture, and in many cases traces their history.

T. M. Young, American Cotton Industry. Manchester, 1902. Mr. Young, an Englishman, here presents the results of a trip of observation through the larger mill

can manufacturers contributed to this development? How far have their contributions been the result of conditions peculiar to this country? On the answer to these questions depend to some extent our conclusions as to the stability of the basis on which our cotton manufacturing industry stands. In the United States labor has always been the most expensive factor in the cost of production. Hence if a manufacturing industry is to succeed in this country it must be through the introduction of labor-saving machinery. Moreover, during the last fifty years the most available supply of labor has been that furnished by the foreign immigrants. Those machines which require little skill and whose management can be easily learned, make possible the utilization of labor of this class. Let us see then how the American cotton manufacturers have met the industrial conditions imposed upon them.

For convenience and greater clearness I will discuss the subject under five heads, — (1) preparatory processes; opening, carding, combing, drawing; (2) spinning; (3) spooling, warping, sizing; (4) weaving; (5) converting and finishing. It may be well to begin with an outline of these various processes in the manufacture of cotton goods.

The first process is opening and picking. After the cotton from a number of bales has been mixed

centres of the United States. Comparisons are frequently made between English and American methods.

W. Whittam, Jr., *Report on England's Cotton Industry*. Washington, 1908. As a special agent of the United States Government, Mr. Whittam made a careful investigation of the English cotton industry, the results of which are embodied in this report.

W. A. G. Clarke, *Cotton Fabrics in Middle Europe*. Washington, 1908. This is a similar report of another government agent, on cotton manufacturing in Germany, Italy, and Austria.

Enquete sur l'Etat de l'Industrie Textile. Paris, 1905. This is the report of a government commission. It is concerned primarily with the investigation of labor conditions in the French textile industries, but in the evidence are found occasional references to machinery and methods.

S. H. Higgins, *Dyeing in Germany and America*. Manchester, 1907. The author of this book personally inspected various dyeing plants in Germany and America.

and loosened up in the bale breaker, it passes to the opener where it is further loosened up. Then it goes to the pickers, where the fibres are separated and the dirt shaken out. From the finisher picker, the cotton issues in the form of a lap ready for the card. The card removes whatever dirt remains, at the same time straightening out the fibres. As the rope of cotton, called "sliver," about the size of a man's thumb, comes from the card, it is coiled mechanically in a can. If the cotton is to be used for spinning fine yarn or hosiery yarn, it is next combed. But for ordinary purposes the cans of sliver are taken directly to the drawing frame, where several ends, usually six, are drawn into one by means of two sets of rollers revolving at different rates of speed. All the processes up to this point are designed partly to clean the cotton, but more especially to secure greater evenness in length and weight. While they are adjusted somewhat differently, according to the grade of work desired, the object is the same throughout, a continual redoubling and drawing out.

The fly frames receive the cotton next, and here the twisting of the sliver begins. There are always three sets, and in some mills four sets, of these fly frames, — the slubber, intermediate, jack, and roving frames. These machines, tho called by various names in different mills or in different sections, are the same in principle. Each succeeding frame draws out the cotton into a finer thread and puts in more twist. From the last of the fly frames the cotton goes to the machine on which the spinning is done, either a mule or a ring frame.

The weft yarn is ready for the loom as soon as spun. But the warp yarn, that which is to form the threads lengthwise of the cloth, must be spooled, warped, and

sized. On the spooler the yarn from several bobbins is wound onto spools, for convenience in warping. A number of these spools are placed on a large frame called a creel, whence the yarn is rewound onto the beam of the warper. This beam, a small roller, varies in length with the number of ends which are to be wound upon it. The number of ends, in turn, varies according to the width of cloth to be made. The beam when filled is carried to the slasher, where the yarn is sized, being run through a solution of starch, China clay, tallow, flour and other ingredients, varying according to the particular formula of each mill. After this treatment, the ends of the sized warp yarn are drawn into the harnesses of the loom, on which the cloth is woven. For converting and finishing the cloth there is a variety of methods, and consequently a variety of machines. There are the machines used in dyeing, bleaching, and printing, and loop cutters, shearers, brushes, calendars, as well as machines used in inspecting, folding, and packing.

Such are the main processes through which the cotton passes from the time it leaves the bale till it is ready to be shipped to the jobber or retailer. In all of these processes more or less improvement has been made during the last fifty years.

I — PREPARATORY PROCESSES:

OPENING, CARDING, COMBING, DRAWING

The machines of this group loosen the matted cotton of the bale, remove the dirt and shorter fibres, straighten and lay parallel the other fibres, and draw them out into a finer and finer thread of even weight. The object is uniformity in length of staple and in weight of lap and sliver.

In the machinery used for the initial processes the chief changes have been in the direction of perfecting machines already used in 1860. The bale breaker has come into more general use; so that, in the United States at least, hand labor is no longer used in loosening up the cotton after the bale has been opened. The heavy laps of cotton are thrown from the bale directly into the bale breaker. Altho the method of carrying the cotton from this machine to the next has been improved, it still varies widely in different mills. In a few mills the cotton is delivered automatically into bins, and thence fed by hand into the opener or the automatic feeder. But the use of machines for feeding the cotton directly to the automatic feeder is becoming more general. For this purpose blowers are used to transport the cotton from the room in which the bales are opened to the room in which the openers are located. The blower consists of a large pipe through which the cotton is forced by fans. At the present time as a result of improvements, cotton in some plants is blown a thousand feet by this means. The economies of this method of transportation are two. In the first place the bale breaker can be put in a separate building, whereby the danger of fire is lessened, no cotton being stored in the mill proper. In the second place cotton from several bale breakers can be fed into the same pipe and a better mixture obtained.

For delivering the cotton directly to the automatic feeder or the opener several machines have been devised. Of these the Morton Automatic Distributor is probably the most economical. This machine, a recent American invention, consists of a steel trough extending over the feeders. Into this trough the cotton is delivered from the blower. The bottom of

the trough is a travelling apron, and on the side over the hoppers of the feeders are gates. When a hopper is nearly empty the gate in the trough above opens automatically, permitting the cotton to run out till the hopper is refilled. Then the gate closes automatically and the cotton in the distributor passes on till it comes to the next open gate. This machine saves floor space, since no bins are required and no cotton is piled on the floor behind the openers. It also saves labor, since after the cotton is fed into the bale breaker it does not have to be handled again till it has come from the breaker picker.

The cotton is fed automatically from the opener to the first or breaker picker. If the openers and pickers are in the same room a combination machine is commonly used. Otherwise the cotton is carried from the opener to the picker by a blower or a trunk. The machinery varies widely between different mills according to the arrangement of the plant or the prejudice of the superintendent. But the principles are the same. After the cotton comes from the breaker picker, it is passed as a rule through an intermediate and a finisher picker, tho in some mills only the breaker and finisher pickers are used. These machines, both openers and pickers, have been greatly improved since 1860. But the English manufacturers have led the way, the American manufacturers having accepted the improvements made in England. The machines in use in the two countries are very similar, and are run at practically the same speeds.

The English have also taken the lead in improving the card. They have, in fact, brought about a revolution in carding since our Civil War, by the introduction of the revolving flat card. The stationary flat card had been improved in the fifties by Wellman,

an American, who introduced a device for automatically stripping the flats.¹ This type of card came into general use immediately after the war, in those American mills which had not adopted it previously. But about the same time the English manufacturers were developing the revolving flat card. On this card the flats are arranged to move in a sort of endless chain, part of them at work and part exposed to be cleaned. It is built entirely of steel, whereas the frame of the Wellman card was wooden. The steel construction makes possible more accurate adjustment; the card can now be set to one thousandths of an inch, and adjusted minutely to the grade of work desired. It also can be more easily cleaned, and more easily and more accurately ground; and less floor space is required. But of especial interest to us is the fact that the output both per machine and per operative is greater. The principle of this revolving flat card is said to have been known since 1834,² but it was not taken up till 1857.³ The first revolving flat cards were then introduced in England, and after the "cotton famine" soon replaced the old roller and clearer cards. Even before 1867 some revolving flat cards were imported into the United States,⁴ and in 1883 a card of this type was first made in this country. Yet it was not till after 1885 that the rapid replacement of the stationary flat cards began. By the present time, however, the few remnants of the old style cards in our mills are being thrown out.

The improvement of carding machinery by the English manufacturers is significant of the attention

¹ R. Cowley, *History of Lowell*, p. 145.

² Twelfth Census, vol. ix, p. 43.

³ *Idem*.

⁴ New England Cotton Manufacturers Association, *Transactions*, No. 3 (1867), p. 21.

which they have always given to the introductory processes, — the same attention which resulted in the improvements in opening and picking machinery. This characteristic was shown early in the nineteenth century, for Montgomery, in 1840, commented on the better carding in English mills.¹ And very recently Mr. Whittam notes a similar difference.² The greater waste in carding in American mills is explained by the extra labor cost of preventing this waste. The American manufacturers economize in labor rather than in raw cotton, and in order to obtain the maximum output per operative, push their machinery harder, thus impairing the quality of the work perhaps, and causing more waste. In the main, however, there is no great difference in the machines or in the speed at which they are run, in the two countries. The improvements have been made in England, but they have been adopted in the United States. And the saving has probably been greater for the American manufacturer, inasmuch as the reduction of the labor cost of carding, if relatively the same in the two countries, must have been greater absolutely in our mills. Further, these cards require little skill on the part of the operative except for the few grinders necessary, and consequently the immigrant can be used for this work. The revolving flat card, therefore, is adapted to the conditions both in the United States and England. As might be expected, we find practically no differences in the method of carding.

The comber was invented in France by Heilmann in 1845.³ Later it was improved by the English manufacturers. Its use in American mills has been

¹ J. Montgomery, *Cotton Manufacture*, p. 32.

² W. Whittam, Jr., *Report on England's Cotton Industry*, p. 19.

³ J. Zipse, *Textile Raw Materials and their Conversion into Yarn*, p. 169.

very limited until recent years. This limitation was due to the fact that the comber, which separates the long fibres and combs out the short ones so that the staple can be spun to greater fineness or with looser twist, is employed only in the manufacture of fine yarns or hosiery yarns. Since the recent development of the production of these yarns with the rise of the knit goods industry and the increase in the output of fine cloth, more combers have been installed. Up to 1897 all combers in American mills were imported.¹ In that year, however, an American cotton machinery firm introduced a new and improved comber. About the same time similar improvements were made in England and in Germany,² showing that other cotton manufacturing countries were feeling the need of reducing the cost of producing combed yarn. The principle of all of these new combers was that of the Heilmann, the differences being in details. In the American comber (to take this for illustration) the speed was increased from 85 and 90 nips per minute to 130 and 135 nips per minute, the number of heads per machine from six to eight, and the width of the lap from 8½ inches to 12 inches. Moreover the quality of the work was not impaired. The effect of these improvements has been to cut in two the labor cost of combing,³ doubling the output per operative. The saving on the English or Nasmith comber, and on the German combers, the Montfort and Alsatiennne, has been equally great. In fact many American manufacturers prefer the foreign made combers and use them in their mills. This preference may be due in

¹ National Association of Cotton Manufacturers, Transactions, No. 82, p. 340.

² New England Cotton Manufacturers' Association, Transactions, No. 69, pp. 342-346; No. 78, pp. 183-194; No. 82, p. 342.

³ Ibid. No. 82, p. 344.

part to prejudice, but very likely to more careful construction of the foreign machines, whereby the higher initial cost resulting from the import duty is counter-balanced. The economy in labor is about the same in either case, and, as in carding, the saving has been absolutely greater for the American manufacturer.

Combers are not in general use in this country, however, since the use of the comber necessitates several additional handlings. Not only must the cotton be combed, but the sliver from the card must first be transformed into a lap on the sliver lapper to prepare it for the comber. After it has been combed it must be changed back to a sliver for the drawing frame. Each of these processes enables greater doubling and drawing, whereby the uniformity is improved; but the extra labor involved still causes a considerable increase in the labor cost. This is an important reason for the greater cost of manufacturing fine yarns and knitting yarns. None the less, the improvements in the comber have promoted the manufacture of fine goods and of knit goods in the United States.

Since 1860 no change has been made in the drawing frame except to improve its construction. The railway head, which collects the slivers from several drawing heads and draws them into a single sliver, has, however, been abandoned by most American manufacturers. Some mills now employ only a single process of drawing. And where two sets of drawing frames and a railway head were formerly used, the American manufacturers have adopted the English practice of using three sets of drawing frames,¹ since the machinery is simpler and more easily regulated. Not only has the construction of the drawing frame been made more accurate, but its efficiency has also

¹ New England Cotton Manufacturers' Association, Transactions, No. 71, p. 259.

been increased by improvements in the stop motions which were in use before 1860. Now the machine stops if the back sliver breaks, if the front sliver breaks, or when the can is full. The electric stop motion, which has come into general use, is the most important of the innovations. The result has been to enable the operative to tend more machines, thus reducing the labor cost, and to turn out product of better quality.

The fly frames of the present are also similar to those of 1860, except that they are longer and better constructed. The lengthening of the frame has made it possible for the operative to tend more spindles. But of more importance, — in fact the thing which has made feasible the greater length of the frames — has been the perfecting of the machine. Roller bearings have been introduced, and the construction improved throughout. Moreover, since 1875, electricity has been applied to the stop motions of the fly frames, producing economies similar to those from its use on the stop motions of the card and drawing frame.¹ For the perfecting of these fly frames the cotton manufacturing world is largely indebted to the English manufacturers. It is true that some improvements have been made in this country, as for example that recently introduced by a Boston firm, whereby the arm of the flyer is changed so as to increase the output per spindle. But in the main the changes have been introduced from England. Yet the fly frames in American mills are fully as good as those in English mills. In fact many English-made fly frames are to be found in American mills. As between the two countries, the machines are similar and run at about the same speeds. The improvements have, however,

¹ Centennial Exhibition 1876, Reports and Awards, vol. III, Group 8, p. 19.

been of especial advantage to the American manufacturer. For the labor cost has been greatly lessened, by increasing the output per machine and per operative. In one prosperous New England mill, for example, the average earnings per slubber-tender have increased eighty-five per cent since 1880. At the same time the saving to the mill has been at least equally great. There has been a similar saving on the other fly frames. Undoubtedly the saving has been not so great in some mills, and perhaps greater in others. But at any rate it shows the tendency toward reduction in labor cost.

From this survey of the processes introductory to spinning, it appears that there are few differences in the machinery used in England and in the United States, and that manufacturers in the latter country have on the whole followed in the steps of their foreign competitors. In fact, in all these processes except opening and picking, there are many English made machines in use in this country. The readiness with which these inventions have been adopted in this country show how well they were adapted to the conditions in both countries. Furthermore their introduction has brought fully as great savings to the manufacturers in the United States by the reduction in the labor cost. The cumulative effect on the quality of the work has also been important. For, as the elementary processes are improved, it becomes possible to produce better results in the succeeding processes. The cotton is better prepared for the next machine and hence its work is facilitated.

The question may well be raised how it happens that the English have taken the initiative in perfecting these machines; since the changes have been at least equally important to the American cotton manu-

facturers. The explanation must be that they have felt more pressure at these points than have the American manufacturers. The necessity of economizing in raw cotton may have had some influence; there is less waste on the improved machines. But the chief cause has been the development of fine spinning in England. As other countries have established cotton mills which have competed in the coarse and medium grades of goods, the English manufacturers have turned to the manufacture of finer and finer grades. In order to spin fine yarns it is necessary to exercise great care in the preparation of the cotton. This has led to the perfecting of the machinery for these processes. On the other hand in the United States the manufacture of fine goods has begun to develop only recently. Consequently the American manufacturers have been content to adopt the improvements introduced by their English rivals. And in the manufacture of coarse goods they have received as much if not greater benefit.

II. SPINNING

Spinning is the twisting together firmly of the fibres of cotton to form yarn. In the previous processes only enough twist has been put in to make the fibres hold together while being doubled and drawn. At this stage the cotton is made into a firm, compact thread.

If the American manufacturers¹ have shown little independence in improving the machines for the preparatory processes, the story for all the later processes

¹ By "American manufacturers" are meant both the cotton manufacturers proper and the machine manufacturers. In many instances the machine manufacturers introduce improvements or invent new machines. But these are not a success till they have been accepted by the mills. Not infrequently some person connected with the mill originates an important improvement. Hence the term is used in a general sense.

is quite different. Here they have introduced new types of machines which to a certain extent are peculiar to this country. This characteristic is manifested to as great an extent in spinning machinery as in any.

There are two types of spinning machines, the mule and the ring frame. The former is of English parentage and descent. The latter is an American product. As the machines are different in principle it may be well to give a brief description of each.¹

First as to the mule. The bobbins of rove as they come from the roving frame are placed in rows on top of the machine. Then the ends of cotton are drawn through sets of rollers, geared so as to revolve at different rates of speed and thus draw out the thread. From the rollers the thread of cotton passes to the spindles, which are mounted on a carriage. This carriage runs on an iron track, and as the rollers revolve the carriage backs away, at a speed great enough to draw out the threads still more. After the carriage has withdrawn to a distance of about sixty-three inches, it stops. During this outward movement the spindles are stationary. But when the carriage stops, they begin to revolve, thus spinning the yarn (that is, twisting it). As the carriage returns the yarn is wound on to the spindle to form the cone shaped cop, the process of building being regulated by the faller wire, a device which moves up and down to guide the yarn. In the meantime the rollers have been inactive, since they stop when the carriage stops and do not begin to revolve again till the carriage starts out once more. The mule was invented in England in the eighteenth century. At first it was

¹ A good brief description, but more in detail than that given here, can be found in J. Zipser, *Textile Raw Materials*, pp. 184-200. Similar descriptions are to be found in other technical books.

operated by hand, but about 1825 the self-actor was introduced. Since then minor changes, for example the adoption of the self centering principle for the spindle in 1885,¹ have been made. The mule has from the first been a very complex machine; few in any industry are more complex.

The ring frame is less complicated. It consists of sets of rollers, similar to those in the mule, for drawing out the rove. But the spindles are directly underneath. Around each spindle is a steel ring. There are at least one hundred and twenty eight spindles per machine, and all the rings in each machine are fixed in a single frame. On each ring is a little wire, called a traveller, through which the thread passes to the bobbin on the spindle. As the spindle revolves this traveller is drawn around the ring, receiving its impetus from the yarn. Thus it revolves a little more slowly than the bobbin, whereby the twist is put into the yarn. At the same time the yarn is wound onto the bobbin, and, in order to secure uniformity in winding, the frame of rings moves up and down slowly. The ring frame was invented by an American in 1831, but it did not at once replace the mule. In fact, in 1860 the number of mule spindles and the number of ring spindles in use in the United States, were still about equal. With the close of the Civil War, the American manufacturers turned their attention to the improvement of spinning machinery, with the result that in the early 'seventies several improvements were made in the ring spindle. In these improvements Sawyer and Rabbeth were foremost, altho other inventors soon added their contributions.² Several

¹ Eleventh Census, vol. VII, p. 170.

² For an account of the development of the ring spindle see the address by W. F. Draper on "The History of Spindles" in Transactions of the New England Cotton Manufacturers' Association, No. 50, pp. 13-46. A good summary is also given by G. O. Draper in *Textile Texts*, 2nd ed., pp. 141-154.

of the improvements were combined and the whole construction of the machine perfected. The spindle was reduced in weight, and its point of support was changed to an elevated bolster. By these changes and improvements the power cost was reduced, the speed increased, and the quality of the work improved. The limit of production on the ring spindle is the speed of rotation. Before these improvements were introduced the average speed was 5,500 turns per minute, although higher speeds were attained even before 1860.¹ By 1875 the average speed had been increased to 7,500 revolutions, and soon after it was further increased to 10,000 revolutions per minute. At the present time, while the average speed is still 10,000 revolutions, on fine yarns it sometimes is as high as 12,000 or 13,000 revolutions.² The speed is now limited by the rapidity with which the operative can make good piecings, and especially by the tendency of the traveller to fly off if the spindle revolves at a speed much over 10,000 turns per minute. These higher speeds require no more power than was employed to drive the old spindle at the lower speed. The work is better and the output per spindle greater. The length of the frame has been increased and the spinner can care for more spindles. As a result the output per spinner has been at least doubled.

There are essential differences, not only in principle, but also in operation, between the ring frame and the mule. On the same grade of goods the speeds of the ring spindle and of the mule spindle are about

¹ Baird stated, in 1851, that the ring spindle "may be driven at a speed of 9,000 revolutions per minute, with perfect security, when making coarse yarn, and when operating upon the finer numbers 10,000 revolutions per minute is not an extraordinary speed to be attained." (Baird-American Cotton Spinner, p. 155.) Other accounts do not seem to fully justify this statement, and the average speed then was probably considerably less.

² Textile World Record, vol. xxii, p. 81.

equal. But the product is greater on the former, since it spins continuously, whereas the latter spins intermittently. Altho the number of spindles per machine is sometimes greater on the mule, the difference in the output per spindle more than offsets this. Again, the yarn spun on the ring spindle is subject to greater strain, from continually dragging around the traveller. Yet this strain is constant. The strain on the yarn is not so great on the mule, since the spinning ceases while the yarn is being wound onto the cop; but the strain is less regular and breaks are therefore more frequent. The constant strain of the traveller on the ring frame tends to make the yarn harder. On the mule the yarn is softer, since the amount of twist can be more easily regulated, and made slacker if desired. The harder ring-spun yarn is better adapted for the warp than for the weft. In fact it was at first used only for warp yarn. But improvements making possible the spinning of softer yarn have resulted in the spinning of filling also on the ring frame. Yet even now some manufacturers, especially the English, maintain that they produce cloth with a superior "cloth" feeling by using mule spun yarn. Other manufacturers declare that they can produce equally good cloth with ring spun yarn.

However that may be, it seems probable that other factors have more to do in determining which method of spinning shall be used than the feeling of the product. The slacker twisted mule yarn is better adapted to taking a heavy size. It is not twisted as hard, and its diameter is greater for the same count. Thus it will absorb more sizing and presents a greater surface for the size to adhere to. Hence it is preferred for warp yarn in the manufacture of certain grades of coarse goods. Furthermore it has a decided advan-

tage in the spinning of fine numbers since the greater strain on the ring frame militates against its use in spinning fine yarn. It is to be said, however, that the improvements in the ring frame have lessened the strain and finer and finer numbers are being spun upon it,¹ so that in this country the ring spindle is now employed to spin the warp yarn even in those mills which still use mule spun weft.

There are still other differences. On the ring frame wooden bobbins must be used, while on the mule the yarn is wound on a little paper cop or on the bare spindle. The mule does not require doffing (that is, the removal of the yarn from the spindles) as frequently as the ring frame, since the cops hold more yarn. This enables a saving of time in doffing the mule. Furthermore if the yarn is to be shipped out of the mill, the freight charge on the wooden bobbins is to be reckoned with. One writer estimates that while the cost of carrying mule cops is ten per cent of the freight charge on the yarn, the relative freight expense for the wooden bobbins is two hundred per cent.² It costs more to carry the bobbin than to carry the yarn which it contains. Moreover the bobbins must be returned. This is an extra expense; and there is the possibility of their complete loss, especially if the yarn is exported to another country. To be sure, much of the warp yarn is shipped in the form of spools, skeins, beams, or cones, but the filling is shipped on bobbins or cops.

The difference in complexity is also important. The simpler ring frame is less liable to break-down and consequent loss of time. It is more easily re-

¹ Several mills are spinning as fine as 120's, and even finer, on the ring frame. The ring had an advantage here in that the speed is greater than on the coarser counts.

² J. Lister, *Cotton Manufacture*, p. 51.

paired in case of accident. The greater complexity of the mule necessitates more care on the part of the operative, and the more frequent breaks in the yarn require greater attention and more skill in piecing. As a result men are always employed as mule spinners. The danger which a woman's skirts would entail is another factor preventing the employment of women as mule spinners. On the ring frame, on the contrary, the necessary knowledge can be acquired in a short time. Little skill is required and the spinners are usually women or children. For social reasons it may be preferable to have men rather than women and children employed in the cotton mills. But from the manufacturer's point of view it is often desirable to employ women and children so far as possible.

There are still other advantages which the ring frame possesses, as for example the requirement of less floor space and the greater facility in lubrication. But the most important differences between the ring and the mule — to sum up — are those in complexity, in the use of bobbins and cops, and in the yarn itself. It is by reference to these most important differences that we can explain why it is that the ring has been adopted to a far greater extent in the United States than in England.

As already stated, the ring spindle is an American invention. It has been perfected by Americans, and it has been most widely adopted by the American manufacturers. The attention which it has received is shown by the number of patents taken out on ring spindles in the United States, — no less than three hundred and seventy-three between 1870 and 1903.¹ As a result of the improvements the ring frame has almost entirely superseded the mule in this country,

¹ G. O. Draper, *Textile Texts*, 2nd ed., p. 142.

except for the spinning of fine yarns, and hosiery yarns. In 1870 the number of ring spindles was but slightly greater than the number of mule spindles. Since that time, however, almost the entire increase has been in the number of ring spindles. This is shown by the Census returns which give separately the numbers of ring spindles and of mule spindles for each census year except 1880.

SPINDLES IN U. S. — (IN MILLIONS)

	1870	1880	1890	1900	1905
Ring	3.7	****	8.9	13.4	17.9
Mule	3.4	****	5.4	5.6	5.2
Total	7.1	10.6	14.3	19.0	23.2

Thus in 1905 there were more than three times as many ring spindles as mule spindles in operation in the United States. At the present time many mills are discarding worn out mules and replacing them with ring frames. Hence the proportion of mules, in spite of the increase in the quantity of fine spinning, is becoming constantly less.

In Great Britain, on the other hand, the mule predominates. It is in that country that the mule has been developed to its present high standard of efficiency. To be sure, the ring frame was introduced into England during the 'seventies,¹ and its use gradually extended. But the British manufacturers have never extensively adopted the ring frame. At the present time the number of mule spindles is six times as great as the number of ring spindles. In 1907, according to the returns to the International Federation of Master Cotton Spinners' and Manufacturers' Associations, there were 36,667,320 of the former, and only 6,487,393 of the latter in England. Instead of

¹ J. Nasmith, *Recent Cotton Mill Construction*, p. 10.

adopting the ring frame the English manufacturers have devoted their energies to the perfection of the mule. In 1860 the self-actor was used in the manufacture of only the coarsest yarns,¹ the hand mules still being used for all other work. Gradually, however, the self actor has superseded the hand mule for all but the highest counts, so that to-day the hand mule is used in England for spinning only the very finest yarns.

The reasons why the ring frame predominates in this country and the mule in England, are to be found in the differing conditions of the two countries. It is not over-conservatism, nor preference for spinning by the more scientific method, which has induced the British manufacturer to cling to the mule while the American manufacturer has been introducing the ring frame. Rather it is because the mule fits the needs of the British manufacturer better, while the ring frame is peculiarly adapted to the conditions in this country.

In the first place the English mills spin much more fine yarn than do the American mills. As the mule is used for finer yarns, this accounts partially for the greater number of mules in England. Again, in spinning the lower counts more short staple cotton is used in England than in this country. The English purchase more short staple, and they rework more of the waste from the card and comber, thus economising in raw material. This shorter staple would not stand the strain of the ring frame as well; the ends would break more frequently. In the third place, the British manufacturers size the yarn more heavily for certain grades of cloth. In the United States, on the other hand, there is no heavy sizing, and no coarse

¹ S. J. Chapman, *Lancashire Cotton Industry*, p. 70.

mule yarn is demanded for this purpose. Finally, we have an important factor in the separation of spinning and weaving in England, and their combination in this country. In England spinning and weaving are carried on in separate mills. Very few establishments both spin and weave. Hence for the English manufacturer the use of the ring frame would increase expense, in shipping weft yarn at least, because of the freight charges on the bobbins. On the other hand, in the United States the yarn is usually spun and woven in the same mill. If woven in the mill where it is spun, it can be handled as conveniently on bobbins as on cops. This helps to explain why the use of the ring spindle has been restricted in England. So far as this country is concerned, however, the combination of spinning with weaving is as much a result as a cause of the preference for the ring spindle.

There are other factors, however, which make ring spinning adapted to cotton manufacturing in the United States. These are connected with the labor situation. The output per operative is much greater upon the ring spindle than upon the mule spindle. In this country, where the scale of wages is higher, the manufacturers must seek to economize in labor, to reduce the labor cost. Even more important than the greater output per operative on the ring frame, is the fact that less skilled labor is necessary. Thus the labor cost is further reduced. In Great Britain a class of skilled cotton mill operatives, almost a hereditary class, provides an adequate supply of skilled mule spinners. In America, on the other hand, the cotton manufacturers have always had to adapt themselves to a class of shifting and unskilled workmen.

During the first half of the century, when the ring frame was being introduced, and when the operatives

were native born, the labor force in the cotton mills was constantly changing. The employees looked upon the cotton mills as a convenient place to get a start in life. Once having got that start, they left for other employments, so that no skilled class was developed. Since the Civil War the foreign immigrants have invaded the cotton mills of New England. Some of these immigrants have come from Great Britain, and have been possessed of sufficient skill to become mule spinners. But not all of them became mule spinners. Many of them are weavers or slasher tenders. Hence the English immigrants could not supply the entire demand for spinners, or even a considerable part of it. The ring frame, on the other hand, required little experience or skill. Consequently the French Canadian, the Irishman, the Pole, the Portugese, and the other foreigners that we find in the mill to-day, could be employed as ring spinners. Here, as in many other American industries, the possibility of employing the unskilled immigrants and the adaptation of machinery to that end, has been an important factor in promoting the success of manufacturing. The situation has been substantially the same in the South. The southern manufacturers also have had no supply of skilled labor to draw upon, and the ring frame has been of equal importance to the rise of the industry in that section, by making possible the employment of unskilled native help. It has been frequently stated, and is even now stated by some manufacturers themselves, that the troublesomeness of the mule spinners' union has led to the replacement of the mule by the ring frame. It may have had something to do with it. But at present mules are being replaced in mills where there is not a mule spinners union no less rapidly than in the Fall River mills,

where the mule spinners union is considered to be the chief disturbing factor. The fundamental reasons for the throwing out of the mules from the American mills are those just stated: the lower labor cost of spinning on the ring frame, the greater output per operative, and the possibility of employing "cheap labor" for this work. In Great Britain, on the other hand, the supply of skilled labor and the separation of spinning and weaving have perpetuated the use of the mule.

On the Continent of Europe the number of mule spindles is more nearly equal the number of ring spindles. In 1907 the number of each was as follows:—

SPINDLES IN 1907¹

	Mule	Ring
Germany	5 469 785	3 722 155
France	4 122 128	2 480 977
Austria	2 307 267	1 277 167
Italy	1 015 498	1 852 364
Russia	1 031 751	1 319 762

The difference, it will be seen is less marked in these countries than in either the United States or in England. The mule and the ring frame are used to about the same extent. In some regions the supply of skilled workmen and the lower wage scale have made feasible the use of the mule. In others the rapid expansion of the industry has stimulated the use of the ring frame, the supply of skilled spinners being insufficient. Furthermore, there is less fine spinning on the Continent than in England; and many of the establishments carry on both spinning and weaving. Thus the ring frame has found a place. For these reasons the differences are not so clearly marked as in the United States or in England.

¹ This table is based on the returns published in the circular of the Federation of Master Cotton Spinners' and Manufacturers' Associations, for 1907.

III SPOOLING, WARPING, SIZING

By these processes the warp yarn is prepared for the loom. It is unwound from the bobbins or cops of the spinning machine on to spools, thence on to the beam of the warper. From this beam the yarn is unwound as it passes through the slasher, where it is sized, and then rewound on to another beam, on which it is carried to the loom.

We proceed now to an examination of the history and characteristics of the spooler, and here again we find that most of the improvements have originated in this country, and have been adapted to the needs of our manufacturers. The most important of these improvements has been the introduction of the wire bobbin holder, invented by Wade in the seventies.¹ This holder has since been modified somewhat, but only in detail. Its advantage consists in the possibility of running the spooler at a higher rate of speed, and at the same time lessening the wear and tear on the bobbins. Means have also been provided for taking care of the empty bobbins. The first device for this purpose, the chute, delivers the bobbins into boxes by the side of the machine.² Recently the travelling belt has been introduced, whereby the bobbins are collected into boxes at the end of the spooler. By these appliances time is saved and there is less loss of bobbins. The labor cost of spooling has always been relatively high; hence the significance of these improvements in cutting it down. They show how the American manufacturers have sought to relieve the pressure. Not only have the Americans

¹ Centennial Exhibition 1876, Reports and Awards, vol. III, Group 8, p. 20.

² G. O. Draper, *Textile Texts*, 2nd ed., pp. 184-185.

made the improvements, but at the present time it is said that the English have been slow in adopting them.

Another machine which has brought about a saving in the labor of spooling is the Barber Knotter. This little machine, invented by an American in 1900,¹ is a small affair, worn on the back of the hand of the girl who tends the spooler. When a thread breaks, the two ends are put together in the machine, and by merely closing the hand the ends are tied and the loose pieces cut off. The knotter saves at least ten per cent in the time of spooling. Furthermore its effect is cumulative. It ties the ends better than they are tied by hand;² hence in warping the yarn of its tying, there are fewer breaks, and less time is lost in piecing. In weaving, its effects are no less apparent, since bad knots are very likely to cause bad places in the cloth. The percentage of seconds in weaving is cut down by its use. Last but not least, the knotter not only reduces the labor cost by saving time, but also makes possible the utilisation of less skilled labor by doing the work which required most skill on the part of the operative.

The present type of beam warper was invented in England and was in use both in that country and in America before 1860. But it has been greatly improved during the last fifty years, chiefly by American manufacturers. The improvements have consisted in the general perfection of the construction, and in the application of better stop motions than those introduced into this country from England³ before 1860. The result has been an increase in speed and in output per machine. At the same time the number of machines per warper tender has become larger. At

¹ New England Cotton Manufacturers' Association, Transactions No. 72, p. 212.

² *Idem*.

³ R. H. Baird, American Cotton Spinner, p. 205.

present one woman almost invariably tends four machines, whereas thirty or forty years ago there was one tender for every warper. In England, however, I am informed on good authority, the manufacturers have been less progressive in bringing their warpers up to date, and generally there is but one machine per operative.¹ On the Continent hand machines have been employed for warping till comparatively recent years.²

The chain warper, which is used for the yarn dyed or bleached before being woven, has also been improved. The improvements have especially aided those manufacturers producing certain kinds of colored goods, such as stripes and gingham. But the most important inventions in connection with this process have been those which aim to prevent snarls and breaks in the dyehouse and in rewarping and quilling. This object has been attained by winding a thread around the chain from end to end, which holds the yarn together, and prevents snarls and breaks.³ After the yarn has been bleached or dyed this protecting thread must be unwound; and for this purpose a special machine, Straw's Patent,⁴ has again been devised. These innovations, the product of American ingenuity, are of recent origin and reflect the greater attention which this class of work is receiving from the American manufacturers. The dyed warp yarn is rebeamed after the protecting thread has been unwound. The machinery for rebeaming is a spot yet untouched by the inventor, and the work is still laborious. On the other hand, the introduction of the long chain quiller

¹ T. M. Young, *American Cotton Industry*, p. 29.

² G. Beaumont, *L'Industrie Cotonnière en Normandie*, p. 17; also Martin, *Die wirtschaftliche Aufschwung der Baumwoll-spinnerei im Koenigreich Sachsen, Jahrbuch für Gesetzgebung*, 1893, pp. 686-689.

³ G. O. Draper, *Textile Texts*, 2nd ed., p. 212.

⁴ *Idem*.

for preparing the dyed weft yarn for the shuttle has reduced the labor cost of that operation. This long chain quiller is another recent American invention. It can be run by a woman or a girl. Moreover it requires but one operative, who with the aid of this machine, does the work, for which eight or nine men were employed formerly. Yet in spite of the reduction in the labor cost of preparing dyed yarn for the loom during the last ten years, the extra labor necessary for this work is still one of the chief reasons for the greater cost of manufacturing goods in which dyed yarn is used.

Since 1860 the old dressing process for sizing the warp yarn has been superseded by the slasher. The slasher consists primarily of a large cylinder with its underneath surface immersed in the sizing solution. Around this the yarn passes, then over other cylinders where it is dried before being wound upon another beam for the loom. The slasher was invented in England and adopted there before 1860. It was not till 1866 that the first slasher was imported into the United States.¹ In regard to the economies which resulted from its introduction, Mr. Atkinson in his report in the Census of 1880,² stated that "in the use of the slasher one man and a boy working in a thoroly well ventilated room, at a moderate degree of heat, took the place of seven or eight men who had previously been employed in the same work in a room which was of necessity kept at over 100° F., the atmosphere saturated with sour starch." Another statement of the saving accomplished by the slasher, was given by Mr. Tyron in an address before the New England Cotton Manufacturers' Association in 1898.³

¹ New England Cotton Manufacturers' Association, Transactions No. 64, p. 208.

² Tenth Census, vol. II, p. 13.

³ New England Cotton Manufacturers' Association, Transactions No. 64, p. 199.

He said "one dresser formerly would only supply warp for 100 looms on ordinary sheetings at a labor cost of from \$18. to \$24. per week; at present one slasher will supply warp for from 500 to 700 looms on the same class of goods at a cost of from \$9. to \$12. per week." In addition to this economy in labor the quality of the product has been improved, since the yarn is sized more evenly. The American manufacturers at first hesitated to adopt this machine, but as soon as its advantages were recognized they quickly made the change, and as early as 1875 it had come into general use.

In the United States the quantity of size put into the yarn does not vary greatly between different mills. In England there is a wide variation. In American mills the amount of size which is added to the yarn is usually about six per cent of the weight of the yarn, enough to make the yarn weave well. But in Great Britain the amount of size varies from less than fifteen per cent (pure sizing) to over two hundred per cent (very heavy sizing).¹ Thus some English cloth called cotton really contains as much, or even more of other material. When the yarn is sized more than fifteen per cent the object is not so much to improve its weaving quality as to substitute for cotton a cheaper material. The practice of heavy sizing came in England by gradual steps. The stress of competition first encouraged adulteration. Later the Russian War cut off the supplies of the regular sizing materials, and thus increased their price. As a result China clay came to be substituted.² Again, during the American Civil War, when the supply of raw cotton was curtailed, the English manufacturers sought to substitute other

¹ U. S. Daily Consular Reports, March 22, 1907, No. 2824, p. 5.

² British Parliamentary Papers, 1872, (203), p. 2.

materials,¹ and thus the practice of adulterating cotton cloth spread. It was continued even after the supply of raw cotton resumed normal proportions, for the adulterated grades of cloth could be manufactured very cheaply. Because of their cheapness they have made a market for themselves, especially in Asia. The British manufacturers have frequently been accused of cheating their customers, of selling their goods under false pretenses. These accusations may have been true at an earlier date, but at the present time the customers are well aware of the character of the cloth which they are purchasing, and are satisfied with their bargain. The fact is that the goods are better adapted to their purses. At the same time their wearing qualities are not seriously impaired. The native purchaser does not wish to wash his clothes. He would not wash them even if half their weight should not be lost in the operation. He simply wears them till they wear out. By catering to this class of customers the English manufacturers have enlarged their markets. Just as they have reached out in the one direction to cater to the class desiring to buy very fine fabrics, so have they reached out at the other extreme to the class of purchasers who can afford to buy only the cheapest goods.

The American manufacturer has been urged constantly to adopt this method of heavy sizing to expand his foreign trade. Why has he failed to accept this advice? In the first place, as already pointed out, the yarn spun on the ring frame is not so well adapted to taking a heavy size. Hence the method of spinning more economical for the American manufacturer is not so well suited to this purpose as is that of the

¹ British Parliamentary Papers, 1872 (203), p. 2; also R. Marsden, *Cotton Weaving*, p. 325.

English manufacturer. Furthermore, for heavy sizing more supervision is necessary. It is to the advantage of the American manufacturer to economize in labor for spinning and sizing rather than in raw cotton. All these reasons, however, are less important now than they have been in the past. New appliances facilitate the spinning of more loosely twisted yarn on the ring frame, and if the heavy sizing were done on a sufficiently large scale the American manufacturer could probably turn out this class of goods as cheaply as does the English. But the American manufacturer has not yet been compelled to turn regularly to foreign markets for the disposal of large quantities of cloth. To carry on the trade in heavily sized goods profitably a large market would be necessary, since the cost of frequently changing the slasher from heavy sizing to pure sizing, and vice versa, would be prohibitive. The machine can be run far more economically on a single grade of work. Consequently so long as the rapidly expanding domestic market continues to absorb all the cloth manufactured in American cotton mills, so long will the American manufacturer neglect other markets where the competition is keener. Inasmuch as there is no outlet for heavily sized goods in the domestic market, he does not find it profitable to run part of his machinery on that grade of work. It is not because the American manufacturer is more honest that he has failed to develop a trade in heavily sized goods. It is because he has found other lines more profitable.

Let us return, after this digression, to our history of the technical development in the remaining departments, — the weaving and finishing processes.

IV. WEAVING

To make the cloth the threads are interwoven according to the pattern desired. The threads lengthwise of the cloth, called the warp, are subdivided into two or more sets, which are alternately raised and dropped to allow the shuttle to pass under and over them. The yarn crosswise of the cloth, called weft or filling, is carried by the shuttle. If only one color of weft is used a single shuttle is sufficient. But for certain fancy goods and especially for ginghams, in which there are several colors of weft, a drop box loom is used, the shuttles being placed one on top of the other so that they can be brought in to place at the proper time by the up and down motion of the box.

After the warp has been sized the ends must be drawn through the harness of the loom. The harness consists of a frame of heddles, — cords or wires with an eyelet in the centre, through each of which a warp thread is drawn. The number of harnesses per loom varies from two upward according to the complexity of the pattern to be woven. Prior to 1900 several unsuccessful attempts¹ had been made to devise a machine for drawing in the warp. The ends were still laboriously drawn in by hand. But during the last five years two machines have been invented in this country which are supplanting the girls formerly employed for drawing in. The first of these machines is a warp tier, the Barber Warp Tying Machine. It was offered to the trade for the first time in 1904.² To quote from one of the men engaged in introducing it, "the broad principle of the machine is to tie the ends of the last of an old warp to the corresponding

¹ National Association of Cotton Manufacturers, Transactions, No. 81, p. 286.

² New England Cotton Manufacturers' Association, Transactions, No. 78, p. 226.

ends of a new warp." ¹ When one warp is nearly used up, the ends are cut so as to leave a short piece of each thread in the harness. Then, when it is desired to weave another piece of cloth of the same pattern, the harness, with these ends still in it, is brought to the tying machine, which ties together, one by one, the ends of the old warp and those of the new. The principle of the machine is the same as that of the spooler knotter previously described. It ties about two hundred and fifty knots per minute, and does the work of about twenty girls. Drawing in by hand had always been a relatively heavy expense to the manufacturer; by the use of this machine the labor cost is cut down two thirds.² The disadvantage in its use is the necessity of keeping many harnesses on hand, one for each of the different patterns. For every variation in the number of ends or in the number of harnesses per pattern, a different set of harnesses must be kept in readiness. Moreover the machine cannot distinguish colors. Hence it can be used only on plain work. But those mills which make only three or four styles of plain cloth are not hindered by these disadvantages.

The second of these inventions actually draws the ends through the heddles.³ Thus there is no accumulation of harnesses as under the other system. But the drawing-in machine does not turn out as much work as the tying machine. Moreover it wears out the heddles more rapidly. Yet it does effect a marked saving over hand labor, since one man operating a drawing-in machine will draw in about six times as many warps a day as a girl can draw in by hand, on the same grade of goods. Furthermore, the machine

¹ New England Cotton Manufacturers' Association, Transactions, No. 78, p. 226.

² *Ibid.* p. 227.

³ Described in Transactions of National Association of Cotton Manufacturers, No. 81, p. 286 et seq.

is not limited to simple patterns. By means of a Jacquard arrangement, it can be used for six harness work. But, like the tying machine, the drawing-in machine cannot detect differences in color. Hence it, too, can be used only for plain work. Girls are still employed for drawing in the warps where there are threads of different colors. And even on plain work the machines have not entirely superseded the girls, owing to the conservatism of some managers.

These machines were not only invented in this country, but as yet have not been accepted to any extent by foreign manufacturers. In England the work is still done by hand, by men, who earn, I am told, wages as high as \$14 per week, as compared with \$9 per week earned by the girls employed on the same work in our mills. But these men are highly skilled, and do part of the planning which is cared for by the designer in American mills. The machines are the result of the pressure which the American manufacturers have felt because of the relatively high labor cost of drawing in the warps by hand, and the difficulties of obtaining labor for this work. The growth of the industry in this country had greatly intensified this latter difficulty.

The introduction of the warp-tying machine and the drawing-in machine has not only cut down the labor cost to the manufacturer, but has also made possible the mechanical performance of work which was a severe strain upon the mill-workers. Drawing in requires very close application on the part of the operative, who has to sit in the same position for several hours, and watch unremittingly every movement which she makes. The release from this exhausting work will be of benefit to the health of the operatives.

While the danger of mistakes prevents the use of these machines for drawing warps in which there are various colored threads, the bulk of the goods manufactured in this country are plain. Hence the machines are adapted to the needs of the majority of our cotton mills. As a result of their introduction one of the remaining hand processes in the manufacture of cotton cloth is at the present time passing out of existence.

For weaving, the hand looms ceased to be used in American mills long before the Civil War. The power loom was introduced in 1814, and from that time it has been steadily improved. Since 1860 it has shared in the general improvement in cotton manufacturing machinery. While its speed has not been increased to any extent, its construction has been perfected. The tendency has been to improve the quality of the work, and thereby increase the quantity of perfect cloth produced per loom. The improvement in the quality of the work and the diminution of the amount of necessary attention from the operative have been facilitated by the application of better stop motions,¹ — devices which stop the loom automatically when a warp thread breaks, the weft breaks, or the shuttle is out of place. Those stops which had been introduced prior to the Civil War were adapted only to looms weaving coarse cloth. With the increase in the manufacture of fine goods it became desirable to apply stop motions to the looms on those grades, and as a result of the successful use of finer and thinner wire in their manufacture,² they are now found in every up-to-date mill on all grades of work. These stop motions have received their greatest improve-

¹ New England Cotton Manufacturers' Association, Transactions, No. 68, p. 319.

² *Idem*.

ments and exploitation in this country. By means of their use on the more perfectly constructed looms, the number of looms per weaver, and consequently the output per weaver, has become greater. Weavers who formerly tended six to eight looms now tend from ten to fourteen.

The most significant feature in the development of looms has been the introduction of the automatic loom. Of several types of automatic looms, one stands out pre-eminently, the Northrop loom. This loom was put upon the market in 1894 by the Draper Company, a perfected machine. It was the outcome of the efforts of five inventors devoted to this task for several years with the definite object of producing a practicable automatic loom. The fundamental principle of the machine was originated by Northrop, whose name it bears, but at least equal credit is due the Draper Company, because of the foresight and ability of their managers and experimenters through whose efforts success was ultimately achieved. The new features embodied in it are, in the words of one of the inventors, "a shuttle changing device (he means a bobbin changing device), a filling hopper from which bobbins or cops are automatically transferred to the loom shuttle, a peculiar shuttle which can be threaded automatically by the motion of the loom, devices that act to stop the loom if the shuttle is not in position, and a warp stop motion to prevent the making of poor cloth."¹ The most important of these innovations is the weft changing device. The shuttle is not changed when it has exhausted the thread on a bobbin, but the empty bobbin is automatically thrown out, and a full bobbin just as automatically put in its place. This change is made so quickly that the speed of the loom

¹ New England Cotton Manufacturers' Association, *Transactions*, No. 59, p. 91.

is not retarded. A vast amount of time which was formerly spent in the stoppage of the loom on account of exhausted shuttle, is thus saved. On the common loom the shuttle has to be changed every eight minutes or oftener.¹ The Northrop loom stops only when a warp thread breaks, or the shuttle is out of position, thus saving perhaps one hundred stops a day.² The use of one shuttle, moreover, eliminates a large amount of labor in setting the pick, *i. e.* adjusting the mechanism which drives the shuttle. Furthermore, the saving in the wear and tear of the machinery from frequent stoppage is not inconsiderable. In order to bring these results to perfection, a reliable warp stop was necessary, and it is in connection with the designing of the Northrop loom that the chief improvements in the warp stop motion have been made.

Another point, and one on which enough emphasis has not been laid, is the automatic threading device, a boon to the weaver, who formerly had to thread the shuttle from five hundred to one thousand times a day,³ sucking in the filling each time. In doing this he inhaled more or less cotton lint, to say nothing of sizing materials and dust. No wonder that weavers have been spoken of as a consumptive class! The automatic threading device has stimulated other manufacturers to devise means for mechanically threading the shuttle on plain looms.⁴ Yet in many mills the shuttles are still threaded in the old way.

Since first introduced the Northrop loom has been improved in various details so as not only to perfect

¹ Twelfth Census, vol. ix, p. 44.

² In 1895 W. F. Draper estimated the saving in the number of stops per day to be 200; see New England Cotton Manufacturers' Association, Transactions, No. 59, p. 93.

³ *Idem.*

⁴ New England Cotton Manufacturers' Association, Transactions, No. 68, p. 325.

its work, but also to adapt it to a wider range of work. At the outset it was necessary to use ring spun filling. But, by means of skewers, mule cops can now be transferred to the shuttle as easily as bobbins. It is no longer confined to the manufacture of coarse goods. Several manufacturers are now successfully weaving fine cloth on Northrop looms. Moreover, it has become possible to weave more and more complicated patterns.¹ It is still limited to goods with only a single color of weft yarn. Patterns in which weft yarn of different colors is used require a drop box loom,² to which the weft changing device is not adapted.

The chief advantage of the Northrop loom consists in a saving of labor. It has reduced the labor cost of weaving one half, a fact which is all the more important since the labor cost of weaving constituted one half of the entire labor cost of manufacturing cotton cloth. This saving has resulted from the increased number of looms per weaver. One weaver now tends from fourteen to thirty Northrop looms,³ where before he tended six to eight common looms. At the same time less skill is required on the part of the operative. Notwithstanding this increased output of the weaver, there has been no lack of work for this class of mill operatives. Rather has the change relieved a strain felt by the manufacturers, who often found it difficult to obtain enough weavers. With the rapid expansion of the industry during the last fifteen years the difficulties of obtaining weavers would have been much greater, had it not been for the introduction of this loom. Yet the Northrop loom

¹ G. O. Draper, *Textile Texts*, 2nd ed., p. 252.

² See page 140.

³ In one Southern mill there is a weaver tending 34 Northrop looms.

has not been adopted in all mills which are making goods that could be woven on it. Since the initial cost is heavy, many manufacturers have not deemed it profitable to scrap their plain looms. But it has been installed in most of the new mills, especially in the South. As the plain looms in the older mills wear out, they will without doubt be replaced by Northrops.

In England the plain looms have undergone as great improvements during the last fifty years as have the plain looms in the United States. The English manufacturers, however, use a different type of loom, the over-pick, loose reed loom. Without attempting a comparison of the intricate details of the two types of loom, let me quote from Mr. Whittam. He says:—

"In English mills, except for weaving heavy cloth, the 'over-pick' loom, with a loose reed, is in general use. It is contended by the Lancashire weaver that he can run his looms at decidedly greater speeds, adjust the pick to a greater nicety, and better avoid costly 'smashes' from trapped shuttles than would be possible with the underpick and fast-reed style of loom, which is in general use in the United States."¹

The chief reason for this preference of the English manufacturers, seems to be that the over-pick loom can be run at a higher rate of speed, and a greater output per loom obtained. But the number of looms per weaver in English mills is about one half of that in American mills. Consequently the output per weaver is less in England, altho the speed of the looms is from fifteen to twenty per cent greater.² The adherence of the English manufacturers to the over-pick loom is due in the main to the difference in labor conditions. They have a larger supply of skilled

¹ W. Whittam, Jr., Report on England's Cotton Industry, p. 23.

² E. Helm, An International Survey of the Cotton Industry, in Quarterly Journal of Economics, vol. xvii, p. 249.

weavers, and a somewhat lower wage scale. Hence it is to their advantage to increase the output per machine even if the output per operative is somewhat less. Moreover, owing to the strength of the labor unions in the English cotton industry, a weaver is paid at the same rate per cut without reference to the number of looms which he tends. In American mills, on the other hand, a weaver is paid less per cut when he tends more looms. Tho the rate per cut is less, his total earnings are greater, because he gets off a greater number of cuts. At the same time, the lower rate per cut effects a considerable saving to the manufacturer in the labor cost of weaving. Still another reason why the American manufacturers have failed to adopt the over pick loom is that it requires more attention from the operative. They have clung to the loom which gives the greatest output per weaver.

The hand loom remained in use on the Continent long after it had disappeared from American and English cotton mills.¹ In the United States the hand loom was not used in cotton mills after 1830, nor in England to any extent after 1860.² But in France, as late as 1885 cotton cloth was being woven on more than 33,000 hand looms,³ which was more than one third of the total number of looms in the country at that time. In Germany, and in Italy, the use of the hand loom persisted even longer. In 1861 only nine per cent of the looms in Germany were power looms.⁴ Lochmueller stated in 1906 that hand looms were still in use in Germany under the domestic system.⁵ In

¹ E. Helm, *An International Survey of the Cotton Industry*, in *Quarterly Journal of Economics*, vol. xvii, p. 422.

² W. J. Ashley, *British Industries*, p. 69. ³ H. Lecomte, *Le Coton*, p. 368.

⁴ A. Oppel, *Die Baumwolle*, p. 654.

⁵ W. Lochmueller, *Baumwollindustrie in Deutschland*, p. 18.

Italy as late as 1903, 13,807 of the 78,700 looms employed for weaving cotton cloth were hand looms.¹ The antiquated type of machine has persisted longer in these countries because of the difference in labor conditions. With a large supply of more or less skilled labor willing to work for low wages, there has not been the same incentive for the introduction of labor saving machinery. The lack of this incentive, the conservatism of the managers and of the workmen, and the greater cost of the more expensive power loom, have retarded the extinction of the hand loom. The Continental manufacturers have economised in capital; the English manufacturers, and to a greater extent the American, in labor,

A similar hesitancy has been shown by the European manufacturers in accepting the Northrop Loom. Altho in England this loom has secured a firm foothold, it has not been accepted there nearly so readily as in the United States. Its inventor, an Englishman by birth,² attempted unsuccessfully to induce English machine manufacturers to take up his idea before coming to the United States, the "inventor's Paradise,"³ where his suggestions were welcomed and developed. For the same reasons that its introduction has been slower, its use will probably be more limited in England than in the United States. In the first place, the mule cop is not so well adapted to the hopper of the Northrop loom as is the bobbin of the ring frame. Altho this difficulty has been partly removed by skewering the cops, that operation takes time. Then again, the loom has been adapted but gradually to the weaving of fine goods, and even

¹ *Annuario Statistico Italiano*, 1907, p. 452.

² T. M. Young *American Cotton Industry*, p. 22.

³ *Ibid.* p. 136.

now many of the fine goods manufactured in England could not be woven advantageously on the Northrop loom. Moreover it is not adapted to the weaving of fancies. There thus is a considerable field in England which it cannot reach, a field which is not only absolutely, but relatively larger than in the United States. In spite of the advance in the production of finer cotton cloth in this country, the bulk of our output is still coarse and medium grades of plain goods. Another retarding factor has been the risk and expense of introducing the new device.¹ In the United States, even, many manufacturers have delayed the installation of Northrop looms until their common looms should be worn out. Similarly in England the cotton manufacturers have been unwilling to scrap their machinery and put in these expensive looms so long as their old looms are still serviceable. Finally, the attitude of the workmen has not favored the introduction of the automatic loom.² While there has been no open opposition, the strength of the weavers' unions in England would enable them to hinder the introduction of a loom which would diminish the demand for weavers. The employers have apprehended difficulty in inducing weavers to accept lower piece rates, and only with lower piece rates would the Northrop loom be a profitable investment. The English manufacturers, moreover, do not feel so great pressure to introduce labor saving machinery. Even were the loom to be generally adopted by them, the absolute saving would be less than in this country. Hence they can better afford to delay.

As in England, so in the other cotton manufacturing countries of Europe, the Northrop loom has been

¹ Report of Chamberlain Tariff Commission, vol. II, §§ 88 and 213.

² *Idem*.

introduced but slowly. In France a few mills have experimented with it, but the number of the new looms per weaver has been only from eight to ten,¹ about one half as many as in the United States. Similar experiments, which are being made in other countries, do not succeed in bringing the average output per weaver up to that in the United States. Once more the lack of economy in labor in European cotton mills shows itself. The Northrop loom is not only the product of American enterprise, but it is also peculiarly adapted to the industrial conditions prevailing in this country.

In all of the processes in the manufacture of cotton cloth, the question of humidity is important. It is important because the machinery and the cotton passing through the machinery generate a certain amount of electricity which affects the smoothness with which the work runs. Cotton manufacturing is therefore facilitated by a humid atmosphere, which reduces the amount of electricity generated. Formerly those localities having an unusually humid climate possessed advantages over the localities less favored in this respect. But during the last half of the nineteenth century cotton manufacturers have devised means for artificially humidifying the atmosphere in their mills. One of the first of these methods was steaming, — the introduction of hot steam directly into the rooms. This has now been largely superseded both in England and the United States, by artificial humidifiers which moisten the air with cold water. In England, the degree of humidity is regulated by law² in order to protect the operatives

¹ Enquête sur l'État de l'industrie textile, vol. iv, p. 77.

² 1 Edw. 7. c. 22 ss 90-96.

from the danger of excessive humidification. In the United States, unfortunately, there is no such protection. A new device, however, is being introduced at present which may make regulation of humidity unnecessary. This device attacks the problem from a different quarter by seeking to neutralize the static electricity in the machine and the cotton, through the generation of a counteracting current of electricity. The very simplicity of its principle makes it seem almost strange that no one has applied it before. If it proves a success, as it bids fair to, the necessity of humidification will be done away with, and thereby the health of the operatives benefited and the manager relieved of the trouble of regulating the degree of humidity. While an American invention, its principle will no doubt be adopted in other countries.

V. CONVERTING AND FINISHING

There is wide variety in the machines for converting and finishing cotton cloth, since after it has been woven it may be bleached, printed, dyed, or mercerized, and then put through numerous other machines to finish it, before being shipped. Each of these machines and processes has a history of its own. A brief summary will suffice to show the general tendencies of the development.

The methods of bleaching have undergone few changes during the last fifty years, or even during the last century. With more accurate knowledge of the chemicals it has become possible for the bleachers to adjust their methods more scientifically to the different grades of work. The machinery in general, and the boiling kiers in particular, have been improved, so that a greater quantity of work can be turned out

per machine with less labor.¹ Better facilities for drying have also been an important factor in lessening the amount of time necessary for the process.² The methods and machinery for bleaching are the same in Europe and America, altho there is, perhaps, more machinery in American bleacheries, and the cloth is run through at a somewhat greater speed. Because of this difference in speed a greater quantity of cloth is bleached with a given amount of labor here.

As in bleaching, so in printing, no new types of machines have been introduced during the last half century. Cylinder printing was first used in England in the last quarter of the eighteenth century, and in the United States in 1810.³ The construction of the printing machine is more perfect now, its work better, and more colors can be used. Then, too, the pentagraph has facilitated the engraving of the rollers. But the greatest change has come about in the coloring materials, as a result of the discovery and application of the coal tar colors.⁴ A young Englishman, Perkin, discovered the first of these in 1856, and in 1858 Hofmann, a German, discovered aniline red. Since then many more have been found. In the development of this auxiliary industry the Germans have been pre-eminent and consequently have developed a large export trade in these products. While some coal tar dyestuffs are now manufactured in this country, the greater part used in our mills is still imported from Germany. The introduction of these coal tar colors has brought about a revolution by reducing the labor cost and widening the range of colors. All

¹ New England Cotton Manufacturers' Association, Transactions, No. 77, p. 170.

² See page 157.

³ Census of 1860, "Manufactures," p. 18.

⁴ For a good description of these discoveries see A. Sansone, *Recent Progress in Dyeing and Calico Printing*, vol. 1; also *Cyclopedia of Textile Work*, vol. vi, pp. 149-235; and A. H. Allen, *Commercial Organic Analysis*, vol. III, pp. 100-104.

cotton manufacturing countries, however, have benefited to the same degree from these inventions.

Concomitant with this change in coloring materials has come an improvement in the designs of American prints. But the one has been rather a means than a cause of the other. The improvement in design has been the result of the general development of the cotton manufacturing industry, and especially of the rise of cotton manufacturing in the South. The competition of the southern mills has forced the New England manufacturers to produce goods of a higher grade. But even yet there is little originality in American designs, which are largely copied from Paris. Moreover, the American manufacturers use fewer designs, and turn out a much greater quantity of cloth of any one design, than do the European manufacturers. This is due to the economies of large scale production. It costs less per yard to print large quantities of a single design, than it does where the design is changed frequently. There is an additional saving in that, where fewer designs are printed, it is not necessary to keep so many copper rollers in stock.¹

The printing machines in use in America are similar to those in England. In fact many of our calico printing machines are imported from England. But the output per machine is greater in this country. Mr. T. M. Young states that the average weekly production per printing machine is 20,000 yards in Great Britain, and 75,000 yards in the United States.² Thus by printing more of each design, and also by running the machinery at a somewhat higher speed, the American manufacturers have economized in labor.

¹ S. H. Higgins, *Dyeing in Germany and America*, p. 49.

² T. M. Young, *American Cotton Industry*, p. 119; also Higgins, p. 49.

The invention of the artificial dye stuffs has been an important factor in the progress of dyeing, also, a progress which has been especially rapid since the discovery of "Congo Red" by Böttiger in 1884.¹ This was the first of the so called "direct cotton dyes," and it has been followed by many others. As in printing, the cost of dyestuffs has been reduced, and the results improved. This has led to an increase in raw stock dyeing.² For gingham and other goods in which yarn of different colors is used, the dyeing of the raw stock does away with the expense of preparing the yarn for dyeing, and of rewarping or quilling it after it has been dyed. But there are some disadvantages which, partially at least, offset this saving. It is true that one difficulty has been overcome. Formerly the dyed cotton did not spin so well. But this has been remedied by the introduction of single dip dyes. Yet there is still the loss of dyestuff which colors the cotton that goes to waste; a loss, to be sure, which becomes less as the price of dyestuffs falls. Finally there is the chief difficulty: raw stock dyeing necessitates the addition of a dyeing equipment to the manufacturing plant. The yarn can be sent away to a special dye house to be dyed. The raw cotton cannot. Hence, while many of the gingham mills and some other mills dye their raw stock, there is still a great deal of yarn dyeing. Furthermore, new machines, Straw's Patent and the chain quiller, which have been recently introduced, have reduced the cost of rewarping and quilling the dyed yarn. Hence many mills find it to their advantage to have the yarn dyed outside of the mill.

Piece dyeing, too, has shared in the general progress

¹ *Cyclopedia of Textile Work*, vol. vi, p. 149.

² *New England Cotton Manufacturers' Association, Transactions*, No. 70, p. 318.

As in bleaching and printing, large lots are dyed at once in an American dyehouse,¹ since it does not pay to put through small lots. The most marked contrast with this American practice is found in Germany, where small establishments persist. It is stated that the dyeing is sometimes done in the back yards in Germany.² The necessity of economy in labor has forced the American to carry on the work of dyeing, like other work, on a large scale.

A recent development of importance in the converting of cotton cloth has been the introduction of mercerization.³ This process "consists in treating cotton, in the condition of yarn or of woven goods, to the action of caustic soda dissolved in water, and treating it subsequently with pure water and with dilute sulphuric acid for the purpose of washing out or extracting chemically the soda that remains in the yarn or fabric. The process effectuates both a chemical and a physical change in the constitution of the fibre."⁴ The results of this mercerization are an increase in the strength of the material, greater affinity of the goods for certain dyes and mordants, and a silk-like appearance. But the yarn is less elastic. Moreover it has been successfully applied only to Egyptian and Sea Island cotton. The process is simple, but great care must be exercised in its application. It was invented by John Mercer, an Englishman, in 1844 or 1846, and first put into practice in England. But only since the improvements during the last twenty years has it developed to any extent either in England or other countries. At present, cotton manufacturers are gradually taking it up both in the United States and

¹ S. H. Higgins, *Dyeing in Germany and America*, p. 78.

² *Ibid.*, p. 68.

³ Twelfth Census, vol. ix, pp. 52-53.

⁴ *Idem.*

in Europe. The methods are the same in the different countries.

In connection with converting machinery, perhaps some mention should also be made of the progress since 1860 in the machinery for drying the cloth.¹ Drying cylinders were first used for colored cloth, but with the increase in the amount of cloth to be dried cylinders came to be used also for white goods which had formerly been dried in sheds. Recently the cell drier has been introduced into a few plants for all grades of work.² This machine, in which the large cylinders are replaced by small copper boxes filled with high pressure steam, about fifty of them being enclosed in one big box, was invented by an American, and is adapted to the conditions peculiar to this country, since it is run at a high rate of speed, and is consequently used to advantage only where large quantities of cloth are to be dried at once.

There has been a similar development of other machines for finishing cotton cloth. We now find improved machines for sewing together the ends of the pieces of cloth. The shearing machines are much larger, more complete, with more cleaning appliances, and have rolling attachments. Moreover they run at a higher speed. Stretching machines have been greatly improved. Calendering machinery is more efficient, and runs faster. In singeing practically the same methods are employed as fifty years ago. But the inspecting is now done more carefully, with the aid of mechanical devices. And finally the cloth is now mechanically measured and folded. Some of these machines are used in finishing all kinds of goods. Others are used only for a single kind, as for example,

¹ New England Cotton Manufacturers' Association, Transactions No. 63, p. 237.

² S. H. Higgins, *Dyeing in Germany and America*, pp. 54-55.

the loop-cutter which cuts the loose warp threads on the back of warp spot goods,¹ which previously had to be cut by hand before shearing. The same types of finishing machines are, in general, used in both English and American mills. The greatest improvements in finishing machines during the last fifty years have been made in this country, especially those patented by Curtis and Marble, of Worcester, who are the largest manufacturers of brushing, shearing, and cleaning machinery for cotton cloth, in the world. Moreover the machines are run at a somewhat faster speed in American mills. Thus, as in almost every instance where the type of machine is the same in England and in the United States, the manufacturers push their machines harder in this country.

To sum up: the effect of all the improvements in cotton manufacturing machinery during the last fifty years has been cumulative as regards both quantity and quality. An improvement in one machine not only facilitates its work, but at the same time prepares its product better, so that the next machine can in turn do its work more rapidly and more efficiently. In these improvements the American cotton manufacturers have played an important part. We cannot say that their contributions have been greater than those of their English rivals. But in these two countries have been made all the important inventions in cotton machinery since 1860. There have been occasional inventions in other countries, as Heilmann's comber in France; and the Germans have made a very important contribution by developing the coal tar dyes. But these contributions from other coun-

¹ Warp spot goods are those in which small spots or figures are made by weaving in a group of warp threads only at intervals.

tries are the more conspicuous because so isolated. The English inventions have been, perhaps, more in the direction of quality, while the American inventions have been along the line of quantity. It is true that the Americans have not sacrificed quality, and at times have actually sought it, but their object has been primarily to secure quantity. The American manufacturer must needs economize in labor, and accordingly he has developed machines to that end. He has adopted machines suited to the peculiar conditions with which he was face to face, especially by introducing machines which cut down the labor cost. He has adapted them to the production of large quantities of standardized patterns. And, further, he has developed machines which permit the utilisation of the most available supply of labor, the unskilled immigrant. It is to this development and adaptation, far more than to any protective tariff, that the progress of cotton manufacturing in the United States during the last half century has been due. For that reason the American cotton manufacturing industry stands on a firm foundation at the present time. On a similar adaptation its continued prosperity must depend in the future.

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THE MEASUREMENT OF CONCENTRATION OF WEALTH

THIS brief paper is intended primarily as a reply to an article of Dr. W. E. Persons in the May number of the *Quarterly Journal of Economics*; but it contains also some further development of the points under discussion. The reader would do well to have that article before him. Since the question at issue is chiefly a matter of method in the narrower sense, I will, like Dr. Persons, take the figures used at their face, and will avoid entering upon any consideration of their reliability and comparability. It is best to deal here with but the one question as to what is a correct measure of concentration.

I. *The "Coefficient of Variability"*

The "coefficient of variability" used by Dr. Persons is a function of the so-called standard deviation. This concept relates to the theory of "error" and to the probability curve. Dr. Persons refers to Professor Karl Pearson in this connection. The "coefficient of variation" is defined by Professor H. L. Moore and used by him in a study of the Variability of Wages,¹ as is mentioned by Dr. Persons. It is obtained for any set of figures by dividing the arithmetical average into the standard deviation as calculated from that average. This process makes the test of "variability" or concentration thoroly relative, as it should be.

Dr. Persons says²: "The statistical problem before the economist in determining upon a measure of

¹ *Pol. Sci. Qu.*, vol. xxii, esp. p. 64.

² p. 431.

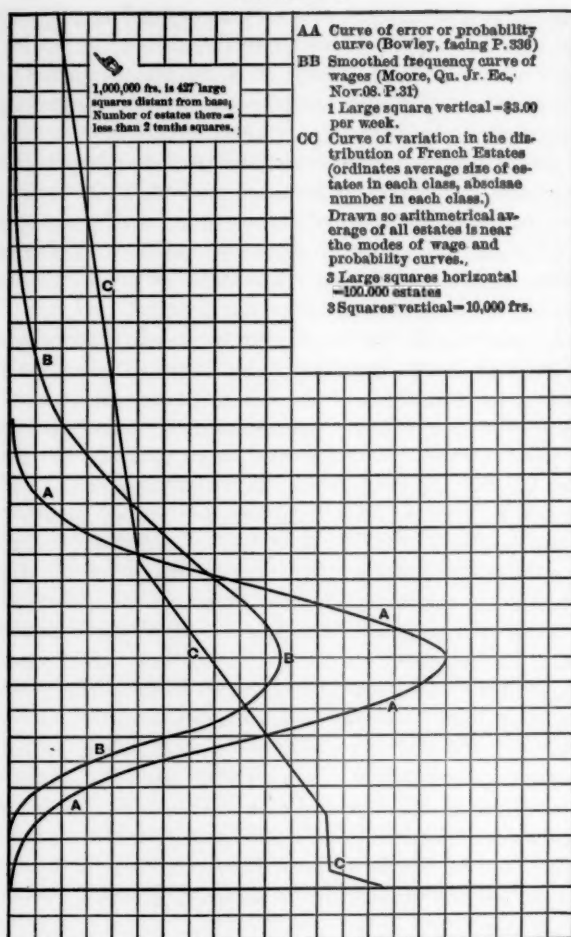
the inequality in the distribution of wealth is identical with that of the biologist in determining upon a measure of the inequality in the distribution of any physical characteristic. In order to determine the variability of the stature of men in a certain community, the investigator would need a statistical table giving the number of individuals of the varying heights. . . . In order to determine the variability of the income or wealth of men of any community, such statistics would be substituted for those of stature."

I find, on the contrary, that the statistical problem before us is evidently *not* "identical" with the problem of variation as studied by the biologist.

A common illustration of the mode of distribution of variants about a mean is the case of a marksman's shots as scattered about the bull's eye. If there is no cause of constant error, these shots will be most dense at the centre of the target and more sparsely distributed as the distance from the centre increases. If we had no means of knowing the point aimed at other than the distribution of the shots, we might determine it as that point from which the deviation of all the other shots taken together is minimal. The method of least squares is used to get the "most probable"¹ mean of several measurements differing from each other owing to causes analogous to those which send the marksman's shot one or the other side of the bull's-eye. Dr. Persons mentions the familiar case of astronomical observations. But he does not stop to consider whether the curve of the distribution of wealth has the symmetrical bell-shaped character of the probability curve. It is obvious, however, that the number of estates or of private fortunes is not greatest

¹ "Most probable" is here used in the technical sense of according to the theory of probability or the law of error.

DIAGRAM I



near the average, tapering away from it in both directions. On the contrary the number of estates within a given range is uniformly greater as the size of the estates is smaller. The curve of the "variation" of the size of estates, that of the variation of wages, and the probability curve, are plotted in the accompanying diagram in a way to facilitate comparison. The curve of the variation of the size of estates should not be confused with the curve of the distribution of the property in those estates. The abscissae of the latter represent the number of estates of a given size or larger, not the number in a particular class.

It is obvious that "nature" (or Providence) is not aiming at making all men equal in respect of property. The "natural" condition, on the contrary, seems to be one of inequality. There is no *typical* size of estate or fortune. The arithmetical average, the mode, and the median do not tend to coincide, as they do in the case of the markman's shots and of any phenomena distributing themselves in general conformity to the "law of error" which finds expression in the probability curve. That which is a proper measure of the dispersion of shots about a bull's eye, or of the variation of stature about a mean, or of the variability of wages, — where, also, the mean is something more than the sum of the items divided by their number — is not as a matter of course applicable to the measurement of concentration of wealth. Dr. Persons' application of the standard deviation to test concentration of wealth derives no support from a consideration of the previous uses or the purposes of the method of least squares.¹ The distribution of wealth is not analogous to the "variations" of biology.

¹ It is worth mentioning, tho a minor point, that Dr. Persons' standard deviation is not correctly obtained. By treating all estates in a class as if they were of the size

II. *Whence should Variation be Measured and how are Variants to be Weighted?*

The "centre" chosen by Dr. Persons from which to measure variability is the arithmetical average. In the perfect symmetrical probability curve the arithmetical average, the median, and the mode coincide. In the curve of the distribution of wealth and in that of the "variation" of the size of estates they part company entirely. Hence the choice between these may mean important differences in the results obtained.

Dr. Persons chooses the arithmetical average on practical rather than scientific grounds. He says: "The deviations are taken from the arithmetic average, which is perfectly definite and easy to compute. In the writer's mind the arithmetic average best represents the 'plane of distribution.' If the median were used, some theory of distribution would have to be assumed in order to estimate it from the frequency table."¹

If there is a "plane of distribution" for estates, as shown *e. g.* in the curve of Diagram I, it is not obvious to me. The mode may ordinarily be taken to be the most "representative" average. But in this case the mode is scarcely above zero. It would appear, therefore, that the point from which "variability in the distribution of wealth" should be measured is zero, or so little above that as to make it best to measure variation from the zero point. The median is, next

of the arithmetical average of their class he does just that which he would avoid in his choice of the arithmetical average as the centre from which to measure deviations; that is, he assumes a law for the distribution of estates between the limits of a class and one that does not fit the facts. (See p. 165.) Such procedure is correct for getting an average error, but not for the standard deviation, tho the falling short of correctness may be of little practical importance.

¹ p. 448-9.

to the mode, the most "representative" average. That the arithmetical average is influenced by the extreme cases in full proportion to their extremeness would, in my judgment, make it less representative. Ought the very large fortunes, or any addition to them that leaves other fortunes as they were before, to be weighed in a balance whose centre is determined so largely by their own distance from it? By making the arithmetical average larger, they increase the size of the divisor and tend to lower the coefficient. The arithmetical average is scarcely adequate to the use Dr. Persons makes of it.

There is another disadvantage of the arithmetical average. It will be greatly influenced by the arbitrary inclusion or exclusion of estates near zero, where there is bound to be much uncertainty and inaccuracy.

Dr. Persons gives no reason for using the standard deviation instead of the average error as a test of concentration. The conformity of the statistics to the law of error would be a good reason. But they do not conform. It would seem to be natural to give the average error a first trial, supposing we can find a proper "plane of distribution" from which to measure the deviations.

One important effect of the use of the standard deviation Dr. Persons does mention. He says: "The larger and smaller estates are automatically weighted by the use of the squares of the deviations. No other more satisfactory method of weighting has been suggested."¹ I can think of no good reason for giving the extreme cases any other than their natural weight, *i. e.*, let each estate count according to its amount.

¹ p. 448.

III. *The Coefficient of Variability as Applied by Dr. Persons to Incomplete Data*

Even if the statistics to be tested by the coefficient of variability are representative and complete, the applicability of this criterion is evidently open to question. But suppose they are not representative or complete, but are instead partial and fragmentary?

Dr. Persons of necessity deals with statistics where those of estates of smaller size are not merely inadequately or incorrectly returned, — they are often altogether wanting, as *e. g.* in the case of the net values of British estates under £100. As if to make the case against him perfect, he has calculated his coefficient for statistics that are less and less adequate, as he omits from consideration more and more of the smaller estates.¹ Under this treatment, his coefficient varies extraordinarily for the same figures.²

Dr. Persons' treatment of the statistics in effect assumes that it is not significant if you truncate the area subtending the curve of distribution and representing the volume of riches. The effect of this can be represented graphically as in Diagram II, Figure 1.

It is evident at a glance that, taken by themselves, the ordinates to the left of B D will exhibit less variation or deviation from their average height than is the "variation" of all the ordinates from A E to C. Not only will the variation be less, but the average height of these is greater than that of all the ordinates. Hence the dividend being made smaller, and the divisor larger, by truncation, the resulting ratio, that is, the "coefficient of variability" tends to be artificially reduced by the use of the incomplete figures. To get the full

¹ Cf. the last column of Table VII, p. 444.

² Cf. p. 441.

effect of the failure to take account of the progressive omission of more and more small estates, one should suppose the truncating ordinate $B D$ moved farther and farther to the left. One will see how, other things equal, the range and variation of the cases must rapidly decrease *relatively* to the mean distance from the 0 abscissa. How the fact that other things are not equal, specifically how the greater steepness of the curve in its upper portions affects the situation, we shall see presently.

DIAGRAM II

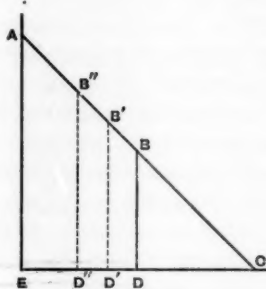


Fig. 1



Fig. 2

Dr. Persons might have forestalled such an objection by taking into consideration only that part of the area subtended by the curve that lies above a horizontal line passing through B . Then his average would be that of estates above B less $B D$, and his "variability" would not be artificially reduced by the size of his divisor. The new base line becomes the line of reference for everything. If it appears somewhat artificial, so are the truncated statistics. Dr. Persons' coefficient would appear to be entirely satisfactory if he would only take as his divisor the average *less* the smallest estate in his group.

But this is entirely true only if the curve showing the distribution of riches as drawn arithmetically be a straight line. We know it is not a straight line. It is in fact highly concave. Instead of resembling the curve of Fig. 1 it is approximately a rectangular hyperbola, which means that it is concave at every point in its course and well pushed in towards the ordinate and abscissa of reference. It has the form roughly shown in Fig. 2. What effect does this fact have upon Dr. Persons' application of his coefficient to incomplete data?

If the average used in getting the coefficient be the reduced average suggested above, should we not expect the coefficient to vary greatly for the same body of statistics according to what classes of estates are omitted? Since we cannot satisfactorily determine the point of truncation for two bodies of statistics by merely making it arithmetically the same for both (of course first reducing monetary units to the same standard), without ignoring the factor of relativity, it is difficult to perceive any practical way of meeting this objection, though it could be met theoretically by cutting the curves to be compared at corresponding points. Even if it be considered sufficient for practical purposes to be guided by the absolute size of estates, it is interesting to note how seldom the division lines for French and British estates are the same — once only, *i. e.* at £10,000 and 250,000 francs — and then the boundaries have different meanings.

Approximate equality in the distribution of property would make the arithmetical curves of distribution (such as those of Diagram II) highly convex instead of concave. The actual curve is highly concave, and concave throughout its length. But cutting off the flattened portion at either end would make it less so.

Hence a test of concentration that treats incomplete figures as if complete should show somewhat less than the actual inequality.

A method, which is open to criticism as not appropriate to Dr. Persons's material when applied to complete statistics (if there be any such), is made doubly and trebly objectionable as he actually applies it, to material that does not profess to be complete, and that is made less so by his manner of treating it.

IV. *The Supposed Superiority of "Some Numerical Measure"*

Dr. Persons evidently attaches importance to getting some numerical measure of concentration. He gives this characteristic a prominent place among the advantages of his coefficient. He makes it the basis of a general criticism of graphic methods, tho the following is specifically directed against the logarithmic curve: "No numerical measure is offered. If, in comparing two curves, the second is steeper at one point than the first, and not so steep at another point, there is no way of telling the net result."¹

Dr. Persons seems to magnify the difficulty of judging slants. He says, "the comparison of slopes of the curves has to be made entirely by the eye." The differences disclosed in the curves that are used in the article criticised are so great that this is not an actual difficulty. If they were not great enough to be seen easily, the correct judgment would be one of approximate identity in the degree of inequality. There are pretty sure to be guide lines on a diagram which aid the eye, and if not, there is no difficulty in comparing the distances separating two curves at various points

¹ pp. 448, 428.

by the use of a ruler. The "net result," also, is indicated by the total divergence of the curves.

Just before the above remark is the statement: "The exact meaning of the test is not evident. As the author himself says: 'Just what the degree of difference is between two series of numbers so compared is not obvious'." Dr. Persons fails to bring out the full meaning here by omitting the rest of the passage, thus: "at any rate to one who is not a trained mathematician, but the *direction* of the difference is unmistakable." "*Direction*" is in italics in the original and the intention to contrast "degree" and "*direction*" is perfectly clear. The *direction* of the difference is important for comparison. But I did not feel able, and did not attempt, to measure the divergence of the curves compared in any way such that one curve might be said to exhibit a quantitatively determinable degree of concentration, say twice as much as another. We can compare curves but cannot, with safety, compare the differences between them in this way.

Is this situation improved by the use of a numerical test? It is perfectly obvious that we can apply our arithmetic and say that one coefficient is twice as great as another. Thus one might be disposed to say, on the basis of Dr. Persons' coefficients,¹ that concentration for all successions in France is over twice as great (1620 is the coefficient) as for those of 10,000 francs (709), and this again over twice as great as for those over 250,000 francs (279). Many would doubtless take such figures to mean that concentration is "twice as great" in the one case as in the other. There is no warrant for this kind of arithmetical manipulation. The fact that it is likely to occur seems to be an objection to the use of *any* numerical measure of concentra-

¹ p. 444.

tion, at least until the mathematics of its measurement are further developed than at present. Dr. Persons himself confines his conclusions to "greater" and "less," thus discussing only direction, and *not degree*, of difference in concentration.

As regards the possibility of a difference in the slants or slopes of the logarithmic curves at different parts, it is one of the distinct advantages of a graphic method that these are preserved. If the "net result" is also in evidence, a graphic would appear to have distinct advantages over a numerical test, only the trouble of making the drawing being in the other pan of the scale.

V. The Lorenz Method as Arbiter

To decide the issue, as regards comparative concentration in Great Britain and France, between the indication of the logarithmic curves and that of his own coefficient, Dr. Persons calls in Prof. Lorenz's test — a graphic method — as arbiter. He procures a verdict in his own favor. It is surprising that he fails to note the other case discussed by him, where the verdict, under the same arbitration, is two to one against his coefficient. He says¹ that the Lorenz method shows least concentration at the earliest of the four Massachusetts periods compared. This agrees with the test by logarithmic curves. But later² he concludes from coefficients: "Probates in Massachusetts showed the greatest concentration in 1879-81 and the *least concentration in 1889-91.*" (*Italics are mine.*) It is necessary, therefore, to examine Prof. Lorenz's method.

I have no theoretical ground of objection to the Lorenz test, provided the statistics are complete. But

¹ p. 417-418.

² p. 447.

it is doubtful whether they ever are nearly enough complete to meet the requirements. Even supposing that, in the use of this method, it is permissible (as it is inevitable) to leave out the propertyless class, the line drawn between the propertyless and the small-propertyed is bound to be very uncertain and unreliable. But a small difference in method of compilation at this point will affect *every part* of the Lorenz curve. Of the statistics brought into the present controversy, moreover, only the French successions meet the primary requirements of the method. The British net figures extend down only to £100 and at that point are perhaps of doubtful accuracy. The Massachusetts probate statistics are not net, and it is doubtless the small estates that are most affected by undeducted debts.

What if the Lorenz method is applied to truncated statistics? Since the curve of distribution is approximately an hyperbola, always getting steeper, the truncation is bound to be, for any test which calls for complete data, of some effect upon apparent concentration. Just what the effect may be, I will have to leave to the mathematicians.

The Lorenz test, also, like that of Dr. Persons, must be affected by the varying distance between the lower limit of the statistics used and the zero fortune. This effect could be obviated by subtractions, like those mentioned above in the discussion of the proposed coefficient.

If we are to cut off the lower portions of the areas representing the amount of riches, how can it be so done as fairly to compare the two sets of statistics? The proper point of truncation cannot be obtained by considering merely the absolute numbers, though there are difficulties even in the way of this simple procedure.

If the test is to be properly relative, per capita wealth must be taken into consideration. If the truncation is not at the same *relative* point in each curve, one curve becomes factitiously steeper than the other.

The differences in the sizes of the British and French estates, as well as the incompleteness of the statistics, and the fact that the lower limits are not the same in terms of absolute amount and presumably not relatively, deprive the Lorenz test of conclusiveness. Just how the result is affected I cannot say. The application of the same test to the Massachusetts statistics, on the other hand, is less open to objection, since they are complete in their way. It would seem, therefore, that the verdict of the Lorenz method favors the logarithmic curve rather than the proposed coefficient.

Dr. Persons makes a good suggestion for overcoming the practical objection to the Lorenz method.¹ But one is curious to know why he connects the points by straight lines in one of these diagrams and by curves in the other. It may be because of the sparsity of the determining points in the second diagram. This suggests an advantage, minor it is true, but worth mentioning, of the logarithmic curve. We do know that the line connecting the determinate points in that case is approximately a straight line. In the Lorenz curve we only know that it is *not* straight, and the points may be so far apart as to leave too much to the discretion of the draughtsman.

¹ pp. 441-442.

VI. *The Advantages of the Logarithmic Curve in General, and also as Modified by the Use of the Average Instead of the Least Size of Estates in Each Class*

Dr. Persons mentions my departure from Pareto's similar use of logarithmic curves, namely, in plotting numbers of estates along the horizontal axis (where Pareto employs the vertical) and size of estates along the vertical axis. The departure was not conscious and also not strange, since I was under no direct obligation to Pareto for the method. The choice was due to the fact that I had in mind the comparison of the "pyramid of fortunes" with the pyramid of ages. In the curve the "pyramid" is put all on one side of the vertical axis. But the conception of the distribution of riches as pyramidal is helpful, even though the curve used to represent it does violence to the pyramid mechanically.

The straightness of the logarithmic curve is, as Dr. Persons says, not essential to the use I make of it. But the fact that it is approximately a straight line has its advantages, as above mentioned, in relation to simplicity and accuracy of construction. Where the number of points definitely determined is comparatively few, it is more than convenient to have an empirical law for interpolation which lends itself so readily to draughtsmanship.

The great advantage of the logarithmic curve, however, relates to the fact that it can be applied without loss of correctness to incomplete data. The omission or the unreliability of the statistics of small estates *does not affect the curve for the remainder*. It is just as if we were compelled to disregard all except the upper portion of an ordinary curve. If so much is reliable

we can make the necessary allowances for distortion along the lower portion, or, for some purposes, disregard that part altogether. The factors which determine the form of the most trustworthy portion of the curve are probably operative throughout the range of distribution.

The adaptability of the logarithmic curve is quite in contrast with both the Lorenz and Persons tests. These require a complete record for use to good advantage. Dr. Persons says :¹ "Objection may be offered to the coefficient of variability because tolerably complete statistics are necessary in order that it may be used. Answer is to be given that only when we do have complete statistics is *any* comparison of variability to be depended upon." The opinion of statisticians would surely not sustain Dr. Persons' implied judgment — which is also contrary to his own practice — that we should wait for complete data before drawing a conclusion. The most that is necessary is due caution in affirming an opinion based on data that are not representative. Any numerical data accurately described, and not cooked or concocted with extraordinary cleverness, may be of use to the statistician.

One important improvement upon the logarithmic method as I have used it does occur to me as a result of my thoughts having been turned towards the subject again. I have plotted as vertical ordinates the *lower limit* of classes of estates by size. It would be better to use for these ordinates the *average* size of estates for each class. This would remove an objection of Prof. Lorenz against various methods, repeated by Dr. Persons in relation to the logarithmic curves.² The size of estates in the uppermost class is not disregarded if the averages, instead of the lower limits, are

¹ p. 440.

² p. 428.

plotted. This is the only theoretical advantage of the modification and it affects the least important part of the statistics.

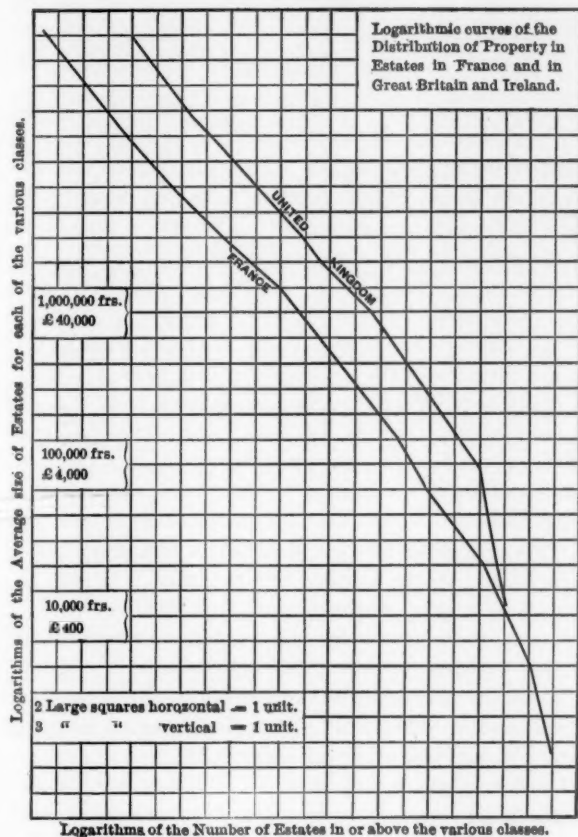
The number of estates exceeding any given amount ought to be sufficient to determine that point of the curve. But in fact boundary lines between classes are often points where taxes change, hence the number of estates is likely to be distorted just here. Using the average reduces this distortion, since the carelessness about reducing estates clearly above a certain limit may counteract carefullness to lessen the figure for those just above it. Whether this lower limit is made inclusive (France) or exclusive (Great Britain), also, is by the use of the average size made an indifferent matter.

In Diagram III are logarithmic curves plotted on the basis of numbers and average amounts of estates for France and the United Kingdom. Owing doubtless to the differences in the method of compiling the statistics in the two countries, the curves diverge less than the logarithmic curves previously drawn without the refinement of averages. This helps us to understand how the inadequate, but not in all respects wrong, tests of Dr. Persons yield a qualitatively different result. According to these curves of Diagram III, it is clear that Great Britain shows greater, though only slightly greater, concentration than France. (The lateral compression of the scale to fit the page reduces the apparent divergence of the curves.) At the 100,000 franc point the two curves are $12\frac{1}{2}$ tenth's (large) squares apart; near the upper ends, 17. Less importance is to be attached to the abrupt lower end of the British curve. In making this comparison in the article which Dr. Persons criticises, I have called attention¹ to the

¹ See the footnote, p. 48.

fact that *inter vivos* gifts are included in the British statistics while excluded from the French. This fact

DIAGRAM III



strengthens the conclusion drawn as to greater concentration in the United Kingdom, and it must corre-

spondingly weaken or destroy the force of any inference from the comparison of these statistics pointing to the opposite conclusion, for the inclusion of *inter vivos* gifts must reduce the apparent concentration of the British statistics.

VII. CONCLUSION

All the objections raised by Dr. Persons to the use of logarithmic curves, as enumerated by him,¹ are met in the foregoing discussion. The meaning of the test is evident to one who is familiar with curves and with the significance of logarithms. The eye is put to no severe strain to tell whether two lines whose position may be shifted right or left at will are parallel or not. The modification of the curve by the use of averages for the size of estates meets the objection with regard to the largest estates. The objection, however, is not in itself very effective, since it assumes that a cause of concentration which has statistical importance can affect only a few estates and will not change the relative numbers in the classes.² The smaller estates were not plotted for reasons that appear above or are evident in the character of the statistics compared. After correcting the misprinted "83 per cent," to 29, the variation in the proportion of the total number of probates that lies below the absolute amount \$1000 for the various periods of the Massachusetts statistics is, with the exception of the decline in the percentage from 1880 to 1890, what should be expected to result from the increase in per capita wealth.

Certain positive claims of Dr. Persons for his own method are enumerated.³ The necessity of having

¹ At p. 428 of his article.

² The point is discussed in a footnote at page 37 of the article in the *Publications of the American Statistical Association*.

³ p. 448 of his article.

complete statistics is a limitation, not an advantage, of his method; or if the first point refers to each estate having its effect on the coefficient, that is not peculiar or remarkable. It is equally true of the modified logarithmic curve. The weighting is unexplained and is a mistake. There is no "plane of distribution," but the rest that is said of the arithmetic average is sound. The question of computation is of no importance for present purposes.

It is well, with regard to the consistency of all the evidence, that Dr. Persons' conclusions do not stand. There is so much collateral evidence of greater concentration in Great Britain than in France that a settlement of this particular question of interpretation in his favor would rather open than dispose of the general questions involved. This applies also with reference to the tendency to concentration in the United States. It is not credible that the concentration of riches in Massachusetts, with all its urbanism and industrialism intensified, was less in 1890 than in 1830.

G. P. WATKINS.

NEW YORK, N.Y.

*The numbers in the following refer to the sections of
Dr. Watkins's Note*

I

DR. WATKINS objects to the use of the coefficient of variability in measuring inequality in the distribution of wealth or income because the frequency curves in such cases are not the normal curves of distribution for which the standard deviation and coefficient of variability were originally derived. I had no idea that any one would suppose the application of the coefficient of variability to wealth and income statistics to be made on the ground of any supposed similarity between wealth-frequency curves and the normal curve of distribution. My argument for the adoption of the coefficient of variability was not based upon *a priori* reasons. On the other hand, the function $\frac{\sigma}{m} \cdot 100$ was applied to hypothetical and actual statistics in order to determine *how it would work*. Exactly the same kind of argument was used by Pareto and Dr. Watkins in justifying the methods that they advocate. I pointed out the character of my argument and its justification in Section VII of my article. No assumption was made that " 'nature' (or Providence) " is aiming to make all men equal in respect of property. In saying that the "statistical problem" of the economist and of the biologist is identical I meant to draw the parallel that both economist and biologist have to deal with series of individual measurements, the items of both sets of series vary among themselves, and the statistical problem in both cases is to obtain a measure of that variation. The measure that biologists use was therefore applied to wealth and income statistics in order to analyze the meaning and effect of that application experimentally.

II

I stated that "the arithmetic average best represents the 'plane of distribution,'" and chose such average as the point from which to measure deviations. If the national income in 1850 was such as to give an arithmetic average income of \$1000, and in 1900 such as to give an average of \$2000, then, according to my notion, \$1000 and \$2000 fix the two "planes of distribution" from which to figure the respective deviations.

The point from which to measure dispersion is not dictated by economics or mathematics, but by current habits of thought. We desire to answer the query, is wealth (or income) being distributed more or less *unequally*? Although writers on economics have not defined "increasing concentration of wealth" in mathematical terms, it is clear that they think of it as meaning a movement away from equality in distribution. In speaking of the distribution of wealth Seager uses the word "unequal."¹ Gide speaks of the "inequality in distribution,"² and illustrates his concept by imagining the total wealth of France to be divided into equal portions.³ Ely says, "In general terms we may say that it (the concentration in the ownership of wealth) means a divergence from an equal distribution, — when wealth is equally distributed there is no concentration, when it is all in the hands of one person there is the greatest possible concentration."⁴ Edwin Cannan says, "To the ordinary person who has not been infected by the study of economic text-books, the term 'distribution of wealth' has a very definite, intelligible, and useful meaning.

¹ Introduction to Economics, p. 593.

² Political Economy (Jacobson's translation), p. 401.

³ Ibid., p. 407.

⁴ Evolution of Industrial Society, p. 256.

— An 'equal distribution' means an equal division: a 'change in distribution' means a change in the proportions in which the total is divided."¹ In the *Growth of Large Fortunes* Dr. Watkins discusses the question, "Is there undergoing—a process of concentration into the hands of a few, and are sharper contrasts developing? Or, is the tendency one toward *quantitative uniformity*" (the italics are mine)² Consequently, it is apparent that the use of the arithmetic average from which to measure dispersion follows the current conception that any tendency away from equality in distribution means greater concentration, the economists' term, or greater variability, the biologists' term.

"Mr. Persons gives no reason for using the standard deviation instead of the average error as a test of concentration." There is a very important and evident reason which I did not feel called upon to state. The shape of the area A in the diagram on p. 434 of my paper³ does not affect the average error $\frac{\sum |x|}{n}$. In other words, there could be a change in distribution among those above the average or among those below the average with absolutely no change in the average error. It is only by the use of some system that gives greater weight to the estates more distant from the average on either side (having larger deviations) than to those less distant (having smaller deviations) that the *shape* of the curve picturing estates according to size can influence the numerical size of the sum of the deviations. The merit of the coefficient of variability is that it is sensitive to any change that is likely to occur.

¹ Quarterly Journal of Economics, Vol. xix, p. 342.

² Publications of the American Economic Association, Vol. viii, No 4, p.161.

³ Quarterly Journal of Economics, Vol. xxiii, May, 1909.

III

Dr. Watkins says that the coefficient of variability "varies extraordinarily for the same figures, yet this suggests nothing to him (Mr. Persons) as regards the limitations of his test." On page 439 of the article that Dr. Watkins is criticising I have said, "It is to be noticed that the coefficient of variability decreases as the range of incomes is made less. On the other hand, α of Pareto's equation does not necessarily decrease. It is not legitimate to compare the concentration of different ranges of income by means of the coefficient of variability, but it is legitimate to compare α 's for different ranges, if α be considered a good measure of variability. By the very process of computing α , *the law of distribution over the entire range is assumed.*" (Italics do not appear in the original.) If the coefficient of variability is computed for incomes over \$5000, the resulting coefficient measures the variability, not of all incomes, but merely of those over \$5000. It is incorrect to assume, as Dr. Watkins does in the application of his logarithmic test, that the same distribution holds for the incomes below \$5000, or for all incomes, that holds for incomes above the \$5000 limit. In comparing the coefficients based upon the statistics of two periods only those estates above equivalent inferior limits should be in the computation. If Dr. Watkins's results are not affected by his not having complete data, there must be something wrong about his method. All that any method can do is to interpret the figures before us.

If the per capita wealth of the second of two periods compared be greater than the per capita wealth of the first of these periods it would be desirable to compare concentration for estates above the same *relative*

inferior limits. The attempt to make such a comparison leads to two difficulties which seem insurmountable. The first is to ascertain the relative value of equal fortunes in the two periods, and second, having done so, to get statistics complete enough so that the relative value can be used. These difficulties are not peculiar to the application of any one method, but to all methods of measuring concentration.

That the application of the coefficient of variability to estates above an inferior limit (called "truncation" by Dr. Watkins) is legitimate was demonstrated on page 435 of my article. A simple numerical illustration may make the point clear. Suppose that six individuals have wealth proportionate to the numbers 1, 2, 3, 4, 8, and 12.

The coefficient of variability for the six estates	=188
" " " " " " first three estates	= 71
" " " " " " last " "	= 71

The first coefficient is greatest because the range is greatest. The second and third coefficients are equal because the distribution among each set of three estates is the same. Since four times each of the first three estates respectively gives the last three, it is evident that the concentration *should* be the same for the two sections.

IV

Dr. Watkins claims that there is no advantage in having a numerical measure of concentration and that the net result in comparing his logarithmic curves "is clearly indicated by the total divergence of the curves." If he means by "total divergence of the curves" the distance between the upper extremities of the curves minus the distance between the lower extremities of the same curves, then he obtains a

numerical measure which neglects the intermediate distribution. Between the extremities the curves may be convex or concave. The decided divergence of Watkins's curves from a straight line may be seen by sighting along the ones given in Diagram III. Pareto avoids the error of neglecting part of the data by finding the straight line which best fits the points located by the statistics. Straight lines have the same slope throughout and hence it is possible to compare the numbers representing their slopes. If the points determined by the statistics do not follow a straight line then the closest fitting parabola may be found. Pareto's method is valuable so long as the "fit" is close, but it was shown (on pp. 425-27) that the error is considerable even in the case most favorable to the application of the method, namely, Prussian incomes.

Dr. Watkins thinks that the use of a numerical measure would lead us to draw such erroneous conclusions as this: "concentration for all successions in France is over twice as great (1620 is the coefficient) as those of 1000 francs (709), and this again over twice as great as for those over 250,000 francs (279)." Can one tell *subjectively* when one stone is twice as hard as another, when one hill is twice as steep as another, etc.? The ratio between two measurements is merely numerical and depends upon the measuring system that we adopt. However, it is not worth while to quarrel about the relative merits of numerical and graphical measures. Both are useful. Dr. Lorenz's method, when scales are used that enable one to follow the relative positions of the two curves, tells what happens all along the line as well as can be pictured to the eye; while the coefficient of variability gives the net result.

V

Dr. Watkins says that I draw inconsistent conclusions from the application to the Massachusetts Probate Returns for 1829-31 and 1889-91, of Dr. Lorenz's method and the coefficient of variability. On page 417 I say "The curve for the period 1829-31 shows

TABLE
SHOWING THE COEFFICIENTS OF VARIABILITY FOR MASSACHUSETTS
PROBATES OF 1829-31 AND 1889-91

	1829-31	1889-91
All Estates	510	426
Estates of \$1000 or over	366	366
Estates of \$5,000 or over	242	252
Estates of \$25,000 or over	133	157
Estates of \$1000,000 or over	67	78

The greater the coefficient the greater the inequality in distribution for the class of estates taken. As the range decreases the coefficient decreases. Coefficients for estates above the same inferior limit are to be compared in order to determine the tendency in wealth distribution between the two periods for the estates above the inferior limit taken.

ESTIMATES

TAKEN FROM THE LORENZ CURVES FOR MASSACHUSETTS PROBATES
OF 1829-31 AND 1889-91

The curve for 1829-31:

Shows greater bulge for approximately the poorest 80% of the estates owning approximately 20% of the wealth.

Shows less bulge for the next 19% of the estates owning some 45% of the wealth.

Shows greater bulge for the richest 1% of the estates owning some 35% of the wealth.

(Greater bulge indicates greater concentration).

the least bulge, except at the lower extremity, where it shows next to the greatest. — All of the curves are nearly coincident for the lower 50 per cent of the estates and for the most concentrated 40 per cent of the wealth. The method is defective in not allowing comparison at these points." It is because of the impossibility of comparing conditions at the upper and lower extremities, and because the curves cross that one concludes that "according to this method of measurement, the least concentration exists among these estates." I intended to caution the reader by the above statements that further analysis was necessary before a legitimate conclusion could be drawn. Such analysis showed the consistency of the two methods. The accompanying estimates are taken from the Lorenz curves based upon all the Massachusetts Probates of 1829-31 and 1889-91. The estimates are not based upon the chart given on page 417 of my article because, as I have explained, the scale is not such as to show what happens at the extremities of the curves. The two curves have been carefully redrawn in two sections, first, to show the lower ends and, second, to show the upper ends of the curves. The estimates are taken from the redrawn curves. The coefficients of variability for various classes of the same data are given in the table above. The coefficients 510 and 426 show that the concentration *among all estates* was greater in 1829 than in 1889. This conclusion is consistent with the Lorenz charts based upon exactly the same data. The concentration among estates above \$5,000, is greater in 1889 than in 1829, which is also the result at which Dr. Watkins arrives. However, the exclusion of estates below \$5,000, throws out 85.7% of the estates in 1829, and 69.6% in 1889. Why should such a large portion

of the data be eliminated? We are making comparison between two sets of data collected in the same way.

The upper portion of the Lorenz curve for 1829 shows a greater bulge than that for 1889. The coefficients of variability for estates of \$100,000 or over show greater concentration in 1889. These results are not inconsistent because the Lorenz curves are based upon *all* the data while the coefficients are based upon the meagre statistics of estates above \$100,000.

In criticising the Lorenz method Dr. Watkins says that the process calls for complete data and that "what is needed is a test of concentration that is applicable to incomplete data." Both the Lorenz method and the coefficient of variability are applicable to any of the data to which Dr. Watkins has applied his logarithmic method. Dr. Watkins seems to think that the application of the Lorenz method to estates of over (say) £100, gives no result of value. By drawing the curves for such estates for two periods on a scale that will enable a comparison of the extremities, a valid conclusion as to the relative concentration *among those estates* can be drawn, unless the curves cross. In case the curves do cross the coefficient of variability must be computed for the same estates in order to tell the net result. Does Dr. Watkins really think that any method will enable us to get an accurate statement of relative concentration for the *entire* population in two periods where "the line drawn between the propertyless and the small-propertyed is bound to be very uncertain and unreliable?" By comparing the slopes of the logarithmic curves for but a portion of their course Dr. Watkins omits the smaller estates without knowing it. Then too, as has been previously pointed out, the two logarithmic curves

vary in curvature throughout their entire length and it is mathematically wrong to speak of a comparison of curvature, unless one means the curvature at two definite points, one point on each curve. By finding the slope of the best fitting straight line, Pareto determined what might be called the average curvature. It would be legitimate to use this average curvature in comparing slopes if the straight lines really picture the distribution of estates with but slight error. Analysis has shown, however, that the error is considerable, too considerable to depend upon the accuracy of the test.

VI AND VII

Does Dr. Watkins appreciate the mathematics at the basis of his logarithmic test and the reasons that lead Pareto to adopt as a measure of variability the slope of the straight line best fitting the points determined by the logarithms of the income data? In the first place Dr. Watkins gives "the straightness of the logarithmic curve" as a reason for connecting *adjacent* points by straight lines. Pareto has applied the legitimate method by taking advantage of the approximate straightness of the logarithmic curve to determine the *single* straight line which best fits *all* the points. The supposed adaptability of the logarithmic test is due, first, to the graphic use of logarithms which makes the errors of the "fit" appear to be less than they really are, and second, to the omission of a large portion of the statistics in getting the net difference of slant of the two logarithmic curves. Thus in comparing the slopes of the two curves in Diagram III, Dr. Watkins is compelled to base his conclusions upon but two pairs of points, for he says, "At the 100,000 franc point the two curves are $12\frac{1}{2}$ small squares apart;

near the upper ends, 17." Neither the curvature between these points nor below 100,000 francs (and hence the distribution) is taken account of. The coefficient of variability, on the other hand is influenced by all of the available data.

Even tho we had a generally accepted method of measuring concentration, there are not sufficient statistical data for measuring it for the United States, European data are but meagre, and no *certain* conclusion as to relative concentration can be drawn from the French and English statistics because *we are not sure that the data are comparable*. However, I have not found any evidence leading me to doubt the accuracy of the test that I recommend — the coefficient of variability. The coefficient and the Lorenz test are applicable to any of the data that Dr. Watkins has used and give consistent results in every case examined. Yet, since the two tests are not identical, it is probable that statistics can be "fixed up" to give different results, but there would have to be very slight difference in distribution between the two sets of statistics compared.

There is need for a method of interpreting wealth statistics that does not allow the subjective element to enter. The coefficient of variability is such a measure. It does not tell the whole story concerning the distribution of wealth, but simply enables one to answer the single question, is the concentration among one set of estates at one period greater or less than the concentration among another set of estates at another period?

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NOTES AND MEMORANDA

WORKMEN'S INSURANCE IN GERMANY: SOME ILLUSTRATIVE FIGURES¹

THE question must have occurred to every one who has followed the German system of workmen's insurance, how great is the direct burden on the employer? To how great an expense in the way of compulsory contributions is he committed by the act of hiring his workmen? The non-German finds it not easy to get a specific answer to this question. The statutes and the administrative regulations tell him what are the rates of indemnity payable to workmen, and give some figures as to maximum rates of contribution. But it is difficult to find a summary statement showing exactly what the employer is in for when he hires his men, and just how much his wages bill is swelled by the insurance payments which the law compells him to make.¹

The figures which follow have been put at our disposal by Mr. Moritz Böker, manager of a large steel manufacturing company of Remscheid, Germany, the *Bergische Stahl-Industrie*. This establishment employed, in 1908, 1750 persons, of whom 1630 were workmen and 120 office employees ("Beamte"). The proprietary company, like so many others in Germany, maintains voluntarily a welfare department, in which systematic provision is made for savings (partly compulsory, partly voluntary), for first care of the injured, for aid in child-bed, for milk, house building loans, and the like. Moreover the office employees, not included

¹ Dr. R. F. Foerster of Harvard University has called my attention to two discussions of this subject which may prove of aid to those who have occasion to follow it. One is an article by Fabrikdirektor Greisal, in the *Jahrbuch für Gesetzgebung*, 1899, giving figures for a single year, chiefly as to brewing establishments. The other, more brief, by F. Somary, in the *Zeitschrift für Volkswirtschaft, Sozialpolitik und Verwaltung* (Vienna), 1906, gives one lump figure to show, by industries for one year, the amount of the employers' contributions to the three insurances.

CHARGES UPON THE "BERGISCHE STAHL INDUSTRIE"

I. Compulsory, as required by the Workmen's Insurance Laws

II. Voluntary

1	2	3	4	5	6	7	8	9	10	11
Year	Average earnings per workman (including 6% of young persons under 10)	Compulsory Contributions, per workman, by the Firm on Insurance Account					Voluntary Contributions, per workman.			
		Sickness	Accident	Old Age and Infirmary	Total	Per cent of Contributions to Wages	Ordinary, recurring annually	Extraordinary	Total (from the firm)	Per cent of voluntary contributions to wages
	Marks	Marks	Marks	Marks	Marks	Per cent	Marks	Marks	Marks	Per cent
1885	1085	8.75	4.65	—	13.40	1.22	9.31	6.00	15.31	1.40
86	1093	8.70	9.11	—	17.81	1.62	9.10	6.00	15.10	1.38
87	1093	8.70	9.11	—	17.81	1.62	9.10	6.00	15.10	1.38
88	1189	8.65	14.46	—	23.11	1.94	10.55	7.60	18.05	1.52
89	1220	9.02	12.39	—	21.41	1.75	12.55	8.00	20.55	1.68
1890	1210	9.35	13.24	—	22.59	1.85	23.73	—	23.73	1.96
91	1171	9.35	13.10	8.49	30.94	2.75	23.73	—	23.73	1.96
92	1128	9.53	13.10	8.49	31.23	2.75	19.01	—	19.01	1.60
93	1143	9.60	13.33	8.56	31.49	2.75	23.99	—	23.99	2.10
94	1126	9.65	13.55	8.57	32.07	2.85	25.00	—	25.00	2.53
95	1213	9.62	13.55	8.50	31.67	2.61	23.03	—	23.03	1.90
96	1190	9.65	12.35	8.49	30.49	2.65	31.22	110.00 ¹	141.22	12.35
97	1200	9.60	11.40	8.49	29.59	2.60	31.22	—	31.22	2.60
98	1200	9.60	11.44	8.49	29.70	2.61	33.85	—	33.85	2.73
99	1465	10.20	12.35	8.46	31.01	2.12	33.30	21.30	54.60	3.73
1900	1455	10.10	13.05	8.50	31.65	2.21	36.62	10.00	46.62	3.25
01	1380	10.08	20.35	8.39	38.82	2.82	37.75	21.80	59.55	4.31
02	1370	9.93	22.49	8.42	40.84	2.99	41.00	10.20	51.20	3.74
03	1421	10.05	24.85	8.43	43.35	3.05	41.00	—	41.00	2.99
04	1421	10.05	24.85	8.43	43.35	3.05	41.00	—	41.00	2.99
05	1519	10.03	28.61	8.36	47.00	3.10	41.10	—	41.10	3.01
06	1573	10.85	25.48	8.50	45.13	2.86	36.21	10.80	47.01	3.41
07	1655	12.90	25.82	8.59	47.71	2.88	42.64	30.59	73.23	4.26
08	1633	12.96	28.94	9.02	50.92	3.11	45.78	10.16	55.94	3.73
1908	1633									
		* 20.20	—	* 9.02	* 35.22	* 2.10	* 45.78	—	45.78	2.80

* Amounts which the workmen had to contribute.

¹ Endowment paid in for the workmen's pension, widow, and orphan fund.² Endowment paid in for the officials' pension, widow, and orphan fund.³ The workmen's pension etc., fund receives annually 14 per cent of total wages, out of the profits of the company. In 1903 there were no profits, consequently no contributions by the firm to this fund.

in the public insurance system, are cared for on similar principles by the firm's private insurance arrangements. Hence the figures include two sorts of payments by the firm, compulsory and voluntary. It is the former (indicated in columns 3, 4, 5, 6, 7) which most interest the non-German reader, since they indicate what is the extent of the obligations imposed on every German employer by the compulsory insurance system.

It is to be borne in mind that the figures state year for year only what is paid out by the firm, and do not include payments made, through deductions from wages, by the workmen themselves. But for a single year (1908) figures are given, by way of comparison, showing what the workmen themselves had to pay. In this year the average wages per workman were 1,633 marks; the amount paid out by the employer on compulsory insurance account was, per workman, 50.92 marks; and the amount contributed by each workman from his own resources (all through deductions from wages) was 35.22 marks. It will be remembered that the charges for accident insurance are carried entirely by the employer; hence in the workman's figures for the year 1908 contributions appear only under the heads of sickness and infirmity.

The average of wages has risen during the period covered (1885-1908) by about sixty per cent, — probably a fair gauge of the rise throughout Germany. The changes from year to year reflect the course of general industrial activity: a gradual rise in 1885-1896, then a sharp upward movement in 1897-1900, a decline for two or three years thereafter, and then another rise in 1904-07. The year 1908 was a bad one in Germany, as elsewhere, and a slight fall in wages appears, due to an unusual number of shut-downs.

The employer's total charges on compulsory insurance account, it will be seen, are now about three per cent of the stipulated wages. Each workman was called on to pay, in addition, a little over two per cent. That is, for every 100 marks paid out in wages, the employer must pay out 3.11 marks more on insurance account; and for every 100

marks of wages contractually due to a workman, he must submit to a deduction of 2.16 marks. The whole insurance system costs about five per cent of the wages; and who can doubt it is richly worth the cost?

F. W. T.

THE FINANCIAL RESULTS OF THE INCREMENT-TAX IN GERMAN CITIES

Two years ago an account was published in these columns of a new departure in municipal taxation — the taxation of the increase in the value of urban land by the cities of Germany.¹ Since the publication of that article official returns have been made showing the yield of the new tax in a number of the cities in which it has been adopted.²

In July of the present year the increment-tax was in force in fifteen of the forty-one German cities with a population of more than 100,000, and in at least forty-one smaller places.³ In the metropolis, Berlin, the *Magistrat* recommended the introduction of the tax over two years ago, but the influence of the House-and-Landowners' Association in the Municipal Council was sufficient to bring about the defeat of the proposal. The tax has, however, been introduced in several of the metropolitan suburbs. The following figures for six cities with a population of more than 100,000 are taken from a return for the thirty-two cities in which the tax went into force prior to the year 1908: —

Name of city (population in thousands)	Tax took effect	Yield (in thousands of marks)		Total Income ⁴ from all taxation (in thousands of marks)
		1906	1907	
Breslau (471)	June, 1907.	—	57	14,276
Cologne (429)	July, 1905.	287	385	12,133
Dortmund (175)	Sept. 1906.	109	159	4,934
Essen (231)	June, 1906.	90	172	5,963
Frankfurt (335)	Feb. 1904. ⁵	1,104	487	13,837
Kiel (164)	Aug. 1907.	—	76	3,636

¹ Vol. xxii, 83-108, (Nov., 1907). "The Taxation of the Unearned Increment in Germany," by Robert Brunhuber.

² Mitteilungen der Zentralstelle des Deutschen Städtetages, Nr. 20 (1909) 553-576.

³ Cf. *ibid.* Bd. ii, Sp. 70.

⁴ Neefe's Statistisches Jahrbuch Deutscher Städte, Jahrgang xiv, (1907).

⁵ The yield for 1904 was 68 and for 1905, 833 thousand marks.

The following figures¹ indicate the estimated and realized yield of the tax in seven suburbs of Berlin for the year 1908. In the four largest suburbs, Charlottenburg, Rixdorf, Schöneberg, and Deutsch-Wilmersdorf, the introduction of tax has been delayed by the same forces as in Berlin. These four are also the suburbs in which the unearned increment has been greatest.

Name of suburb (population in thousands)	Yield (in thousand of marks)	
	Estimated	Realized
Grosslichterfelde (34)	50	29
Pankow (29)	150	147
Reinickendorf (22)	89	124
Tegel (12)	36	12
Tempelhof (10)	40	11
Weissensee (37)	150	188
Zehlendorf (12)	80	169
Total	595	680

The tax is of such recent origin that it is difficult to draw any general conclusions from the available financial results. In Cologne and Frankfurt alone, among the six large cities for which the results are shown, does the period of operation extend over two complete financial years. In each of these the receipts from the increment-tax during the two years averaged slightly over five per cent. of the total receipts from taxation. The fluctuations in the amount of the yield, however, are so wide and so uncertain that in neither city do the financial authorities dare to credit the tax in the municipal budget with more than a fraction of its average annual yield. For 1908 the estimated yield of the tax in Cologne was one hundred and eighty thousand marks, and in Frankfurt it was three hundred and twenty thousand. The probability is strong that these estimates will be largely exceeded. Hence the question arises, what is the best disposition to be made of the excess. With a view to escape from the temptation to squander such easily gotten gains, the better opinion seems to be that the excess, when realized, should regularly be devoted to reduction of debt.

¹ *Soziale Praxis*, Sept. 16, 1909. Sp. 1338.

The more recent increment-tax ordinances follow closely in the path marked out by the earlier ordinances. The tendency is almost universal to tax increases in the value of vacant land more highly than those of the land which is built upon. In all cases large increases are more highly taxed than small increases. The problem of making a fair allowance for differences in the period of time during which the unearned value has accrued has given some trouble. In some cases this problem is solved roughly by granting abatements from the normal rates, which increase in amount with the length of the period elapsed since the last preceding transfer of the property. In other cases approximate justice, at least so far as the first assessment of the tax on each parcel of property is concerned, is attained by limiting the period prior to the passage of the ordinance during which the increase of unearned value is to be taken into consideration, and prescribing an arbitrary initial value upon which the increment may be reckoned. In most of these cases the assessed valuation at the time from which the increment is computed is taken as the basis of computation.

Another problem which has confronted the framers of increment-tax ordinances has been that of the prevention of evasion. Besides most of the ordinary devices for evasion, which are familiar to administrators of income and inheritance taxes, a novel device has appeared, peculiar to the increment-tax. This consists in the transfer of individual holdings to an association of some sort, consisting of the individuals concerned. Since individuals may come and go, but the association is endowed with immortality, the property, so long as it remains in the association, escapes the increment-tax. To meet this contingency, as well as to get at the permanent holdings of business-corporations, the higher administrative authorities in Prussia have recently recommended the municipal authorities to assess the tax on associations and corporations at each change in the membership of the association or incorporated body, the tax to be collected on a share of the total increment corresponding to the share in the property or business held

by the out-going member. At the same time it was directed that the tax be not levied upon inheritances and bequests, nor upon properties expropriated by public authority.¹ The maximum rate that might be levied upon the increment was limited to 25 per cent., and the period prior to the introduction of the tax during which the increment should be taxable to ten years.

Five years have now passed since the first introduction of the increment-tax into the German cities. The rapidity of its adoption into the system of municipal finance is a sufficient indication of the popularity of the innovation. Despite lively opposition on the part of the owners of real estate (a section of the public which exercises an undue influence upon the government of many German cities) the principle of the increment-tax has quickly gained general acceptance, and the higher administrative authorities of all the more important states of the Empire have given earnest attention to the improvement of the details of the tax. Recently the Imperial Government has incorporated the increment tax in its scheme of financial reform. By one of the finance acts, passed on July 15, it is provided that the Empire shall receive twenty million marks from such a tax by 1912. Cities in which the increment tax was in operation before April 1, 1909, will be compensated for five years after the imperial act goes into effect by an amount equal to the average annual yield of the municipal tax prior to April 1, 1909. Compensatory payments will be made, however, only from surpluses to be realized over and above the twenty millions collected for the imperial treasury. Another attestation of the contemporary opinion of European financiers concerning the success of the increment-tax, is its incorporation by the British Chancellor of the Exchequer, Mr. Lloyd-George, in his budget for 1909.

A. N. HOLCOMBE.

HARVARD UNIVERSITY.

¹ Preussische Ministerialverfügung vom 18 Mai, 1909 (Min. — Bl. f. d. inn. Verw. 1909, Nr. 6, S. 148).

A CORRECTION

THE circumstances under which my article "On the Return of Productive Agents" was published, in the last issue of this Journal, caused a disconcerting error in the text, to which I beg to call the attention of the reader who may be interested. On page 583, the equation $\frac{a \times t}{t} = a$ does not correspond to the text. The equation which expresses my thought is $\frac{a \times t}{a} = t$.

A. LANDRY.

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- [12. The American Political System, national, state, and municipal. Professor HART.]
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15. International Law as administered by the Courts. Professor WILSON (Brown University).
18. English Local Government. *Half-course.* Mr. WALLAS.
19. American Constitutional Law. Professor STIMSON.
- [27. Colonial Administration.]
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COURSES OF RESEARCH

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- 20c. International Law
- 20e. American Institutions. Professor HART and Asst. Professor MUNRO.
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4. Statistics. Professor RIPLEY.
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- 8b. Banking and the History of the Leading Banking Systems. *Half-course.* Asst. Professor SPRAGUE.
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